

Pre-Decisional Nebraska Beaver and Muskrat Environmental Assessment

NEBRASKA BEAVER AND MUSKRAT DAMAGE MANAGEMENT

Prepared by:

UNITED STATES DEPARTMENT OF AGRICULTURE (USDA)

ANIMAL AND PLANT HEALTH INSPECTION SERVICE (APHIS)

WILDLIFE SERVICES (WS)

In Consultation With:

U.S. FOREST SERVICE (Forest Service)

NEBRASKA NATIONAL FOREST

SAMUEL R. McKELVIE NATIONAL FOREST

OGLALA NATIONAL GRASSLAND

[REDACTED]

[REDACTED]

U. S. FISH AND WILDLIFE SERVICE (USFWS)

U.S. ARMY CORPS OF ENGINEERS (USACE)

NEBRASKA GAME AND PARKS COMMISSION (NGPC)

[REDACTED] ([REDACTED])

UNIVERSITY OF NEBRASKA COOPERATIVE EXTENSION (UNCE)

NEBRASKA DEPARTMENT OF WATER RESOURCES (DWR)

NEBRASKA DEPARTMENT OF ROADS (NDOR)

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ACRONYMS

ADC	Animal Damage Control
APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
██████████	██
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
DEA	U.S. Drug Enforcement Agency
DNR	Nebraska Department of Natural Resources
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FSM	Forest Service Manual
FY	Fiscal Year
HHS	Nebraska Department of Health and Human Services
IWDM	Integrated Wildlife Damage Management
LRMP	Land and Resource Management Plan
██████████	██
MIS	Management Information System
MOU	Memorandum of Understanding
NACO	Nebraska Association of County Officials
██████████	██
NDOR	Nebraska Department of Roads
NEPA	National Environmental Policy Act
NGPC	Nebraska Game and Parks Commission
NOA	Notice of Availability
RC&D	Resource Conservation and Development
██████████	██
RNA	Research Natural Area
RSN	Revised Statutes of Nebraska
SOP	Standard Operating Procedure
SRA	State Recreation Area
T&E	Threatened and Endangered Species
UNCE	University of Nebraska Cooperative Extension
USACE	U.S. Army Corp of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WA	Wilderness Area
WMA	Wildlife Management Area
WS	Wildlife Services (formerly Animal Damage Control (ADC))

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WSA	Wilderness Study Area
WSR	Wild and Scenic River

CHAPTER 1: PURPOSE AND NEED FOR ACTION

1.0 INTRODUCTION

Across the United States, wildlife habitat has substantially changed as human populations have expanded and land has been transformed to meet varying human needs. These changes have inherently caused increases in the potential for conflicts between wildlife and people. Some species of wildlife have adapted and thrived in the presence of humans. These species are responsible for the majority of conflicts between humans and wildlife. The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Animal Damage Control (ADC) Program Final Environmental Impact Statement (EIS) summarized the relationship in American culture of wildlife values and wildlife damage in this way (USDA 1994):

"Wildlife has either positive or negative values, depending on varying human perspectives and circumstances . . . Wildlife generally is regarded as providing economic, recreational and aesthetic benefits . . . , and the mere knowledge that wildlife exists is a positive benefit to many people. However, . . . the activities of some wildlife may result in economic losses to agriculture and damage to property . . . Sensitivity to varying perspectives and values is required to manage the balance between human and wildlife needs. In addressing conflicts, wildlife managers must consider not only the needs of those directly affected by wildlife damage but a range of environmental, sociocultural, and economic considerations as well."

Biological carrying capacity is the land or habitat's limit for supporting healthy populations of wildlife without degradation to the animals' health or their environment over an extended period of time (Decker and Purdy 1988). Wildlife acceptance capacity, or cultural carrying capacity, is the limit of human tolerance for wildlife or the maximum number of a given species that can coexist compatibly with local human populations (Decker and Purdy 1988). These terms are especially important in urban areas because they define the sensitivity of a local community to a specific wildlife species. For any given damage situation, there will be varying thresholds by those directly and indirectly affected by the damage. This threshold of damage is a primary limiting factor in determining the wildlife acceptance capacity. While Nebraska has a biological carrying capacity that would seemingly support more than the current number of beaver (*Castor canadensis*) and muskrat (*Ondatra zibethicus*), in many cases the wildlife acceptance capacity is much lower. Once the wildlife acceptance capacity is met or exceeded, people will begin to implement population or damage reduction methods, including lethal management methods, to alleviate damage and public health or safety threats. Wildlife Services¹ (WS) is the federal agency directed to protect American resources, property, and human health and safety from damage associated with wildlife (Animal Damage Control Act of March 2, 1931, as amended 46 Stat. 1486; 7 USC. 426-426c and the Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988, Public law 100-102, Dec. 27, 1987. Stat. 1329-1331 (7 USC 426C).

Wildlife damage management is practiced as a field of specialization within the wildlife management profession. The APHIS WS program uses an Integrated Wildlife Damage Management (IWDM) approach to prevent or minimize wildlife conflicts. IWDM as used or recommended by the APHIS WS program includes the integration and application of practical methods to prevent and reduce wildlife damage. In applying the IWDM approach, the APHIS WS program may offer technical assistance, direct operational damage management, or both in response to requests for help with wildlife damage problems. Technical assistance consists of advice, recommendations, information, or materials provided for use in reducing wildlife damage problems. Direct operational damage management consists of identifying the source of the problem and implementing practical, appropriate damage

¹ Wildlife Services was previously known as Animal Damage Control. The name change became effective in August 1997. Throughout this document, the acronyms "ADC" and "WS" refer to the same federally authorized program.

management actions by APHIS WS personnel.

WILDLIFE SERVICES PROGRAM

The mission of Wildlife Services is to provide leadership in wildlife damage management for the protection of America's agricultural, industrial, and natural resources, and to safeguard public health and safety (WS Directive 1.201). This is accomplished through:

- close cooperation with other federal and state agencies;
- training of wildlife damage management professionals;
- development and improvement of strategies to reduce losses and threats to the public from wildlife;
- collection, evaluation and distribution of wildlife damage management information;
- cooperative wildlife damage management programs;
- informing and educating the public on how to reduce wildlife damage;
- providing data and a source for limited-use management materials and equipment, including federal and state registered pesticides (USDA 1989).

1.1 PURPOSE

Beaver and muskrats can be an asset or a liability, depending on their compatibility with human interests and activities in a particular situation. Management of beaver and muskrats should not be either absolute protection or total reduction, but a discretionary management action where conflicts are minimized in an environmentally sensitive manner for multiple-use needs.

Beaver and muskrats cause serious damage to roads, dams, levees, irrigation ditches, hay meadows, pastures, and cropland. Plugging of culverts and damming of irrigation ditches impairs agricultural operations. Beavers cutting ornamental trees and shrubs on residential property is also costly (Hines 1962, Clements 1991, Collins 1993, Olsen and Hubert 1994). Muskrat burrowing activities can damage dams and levees (Miller 1975).

The species and area evaluated within the scope of this EA are beaver and muskrats and the associated damage caused by beaver and muskrats in Nebraska. Nebraska has a total area of about 77,358 mi² (49,509,120 acres) (Nebraska Blue Book 1998-1999) and damage problems can occur throughout the State, resulting in requests for WS assistance. In Fiscal Year (FY) 99, Nebraska WS had agreements to conduct beaver or muskrat damage management on about 264,214 acres or about 0.5% of the land area and averaged 266,045 acres from FY 97 to FY 99 or about 0.5% of Nebraska (Management Information System (MIS) 1997, 1998, 1999). This environmental assessment (EA) has been prepared to facilitate planning, interagency coordination and the streamlining of program management, and to clearly communicate with the public the analysis of cumulative impacts of WS beaver and muskrat damage management on all lands in Nebraska.

1.2 NEED FOR ACTION

The need for action is based on the necessity for a program to protect agricultural and natural resources, property, and public health and safety from beaver and muskrat damage. The beaver population explosion has had a negative economic impact in North America (Novak 1987) and beaver are responsible for the vast majority of aquatic rodent damage reported to the Nebraska WS Program (Table 1-1). Requests for assistance with beaver damage in Nebraska have steadily increased (52 in 1996, 84 in 1997, 94 in 1998 to 167 in 1999). In 2000, Nebraska WS has cooperative relationships with 37 of 93 Nebraska counties. Beaver and muskrat damage to property, agriculture, human health and safety and natural resources reported to Nebraska WS from FY 97-99 was more than \$675,000 (MIS).

1.2.1 Summary of the Proposed Action

The proposed action is to implement an integrated beaver and muskrat damage management program on all lands in Nebraska where a need exists and a request is received to protect roads, bridges, agricultural and natural resources, property and public health and safety (WS Directive 2.105). The proposed action would allow for the use of legal methods, either singularly or in combination. Managers and property owners would continue to be provided technical assistance information regarding the use of non-lethal methods.

Table 1-1. Value of damage¹ in Nebraska as reported to or verified by WS in FY 97, 98 and 99.

BEAVER AND MUSKRAT DAMAGE IN NEBRASKA			
CATEGORY	SUBCATEGORY	BEAVER	MUSKRAT
Agriculture	Commercial Forestry & Nursery	\$13,250	
	Field Crops	\$233,440	\$250
	Other (Hay)	\$3,600	
	Range/pasture	\$15,000	
Human Health & Safety	Human Health & Safety ²		
Natural Resources	Forestry	\$62,600	
Property	Landscaping	\$34,950	
	Structures	\$118,600	\$4,210
	Other Property	\$189,950	

¹ Reported damage is only a small amount of the actual damage beaver and muskrat damage in Nebraska.

² It is difficult to put a value on human health and safety threats, risks or human life.

Nebraska WS conducts operational beaver and muskrat damage management using legally available methods after documenting damage or a nuisance problem. Damage management methods used by Nebraska WS would include: body-grip, leg-hold and live traps, snares, and shooting; beaver dams are breached using binary explosives or by hand. Beaver and muskrat damage management would be conducted on all lands (private, federal, tribal, state, county and municipal) on a request basis, primarily in cooperating counties. Work would be coordinated with the appropriate authorities of land management agencies, and on private lands where signed Agreements for Control are in place.

1.2.2 Beneficial Beaver and Muskrat Activities

It is important to recognize that not all beaver (or resulting dams or ponds) cause problems. Beaver can play an important and cost-effective role in maintaining and enhancing riparian and aquatic ecosystems (Stuebner 1994). Woodward et al. (1976) found that 24% of landowners who reported beaver activity on their property indicated benefits to having beaver ponds on their land. These benefits include hunting and trapping, water for livestock, and the value of beaver ponds to the natural environment. Placement of beaver into selected and suitable habitat can result in improvement of riparian areas (Anon. 1993). Beaver activities can: 1) elevate the water table, 2) reduce water velocity and eroding action of streams, 3) enhance habitat for some fish species within ponds, 4) decrease or retard spring runoff, 5) improve water storage throughout the summer, and 6) improve nesting and brood rearing areas for waterfowl (Anon. 1993). It is difficult to place a dollar value on such benefits.

1.2.3 Need for Beaver and Muskrat Damage Management to Protect Roads, Bridges, Railroad Beds, Property, and Natural and Agricultural Resources.

Beaver are responsible for a variety of damage (Wade and Ramsey 1986, Miller and Yarrow 1994, Willging and Sramek 1989, Loven 1985) and a large contributor of wildlife damage documented by WS in Nebraska (MIS 1999). The primary way beaver conflict with human interests is through their dam building activities. Types of beaver and muskrat damage include: (1) flooding of cropland, such as corn and hay fields (in flat terrain, a relatively small beaver dam may cause hundreds of acres to be flooded); (2) flooding livestock pastures; (3) flooding of bottom lands which can kill trees intended for harvest (beavers also damage and kill ornamental and shade trees by gnawing, girdling and cutting); (4) damming culverts that cause flooding of areas next to roads, railways, or bridges resulting in erosion of the road and railway beds; and (5) burrow into man-made dams and levies and obstruct overflow structures and spillways which can cause such water control structures to fail. Beaver are also known to gnaw on or burrow into styrofoam and wood supports under boat houses and docks which requires expensive repairs. Miller (1983) estimated that the annual damage in the United States was \$75-\$100 million and the value of beaver damage is perhaps greater than that of any other single wildlife species in the United States (Arner and Dubose 1978).

Muskrat damage is primarily caused by burrowing into farm ponds, irrigation ditch banks, water impoundments or reservoirs. Their burrow usually enters below the water level and angles upward to create space above the water level. When the water rises, the muskrat burrows further up the bank creating a situation that could eventually cause dams and levees to collapse. These failures could release water and cause flooding that damage crops and pasture. Another fairly common reported damage caused by muskrats is when farm equipment falls through where muskrats have burrowed and weakened dams and levees. Muskrats may also feed on crops such as rice, soybeans, milo or corn.

1.2.4 Need for Beaver and Muskrat Damage Management to Protect Wildlife

Beaver activity may be harmful to some species of wildlife. While beaver activity does create habitat for some plant and animal species, it also destroys other habitat types (e.g., free-flowing water, riparian areas, and some bird roosting and nesting areas). Water warms during the summer as it passes through either large ponds or a series of ponds (Evans 1948, Adams 1953, Hale 1966). A loss of dissolved oxygen has also been observed in streams as they passed through beaver ponds due to increased bacterial activity and high water temperatures that hold less dissolved oxygen (Adams 1953, Smith et al. 1991). Nitrogen and phosphorus levels also vary within stream systems that contain beaver ponds. Because nitrogen and phosphorus adsorb to clay, trapping of sediment in beaver ponds reduces nitrogen and phosphorus levels within streams (Maret 1985, Maret et al. 1987). In one area of previously low nitrogen levels, stream sections accumulated 1000 times more nitrogen after modification by beaver ponds. Consequently, beaver ponds serve as a sink for nutrients that contribute to eutrophication (Fancis et al. 1985).

Beaver also cut large trees along rivers, lakes and reservoirs that are used as roosting/nesting trees by bald eagles (*Haliaeetus leucocephalus*) or other avian species. It has been established that the presence of beaver dams can negatively affect fisheries (Patterson 1951, Avery 1992). Beaver dams affect stream ecosystems by increasing sedimentation affecting certain wildlife that depend on clear water such as certain species of fish and mussels.

The effectiveness of removing most or all beaver and dams from a stretch of stream can be judged by how quickly the stream “recovers.” Indications of recovery include an increase in areas suitable for spawning (gravel or rocky substrate), revegetation of stream banks, evidence of channel narrowing, improved water quality, and increased fish numbers. A stream's potential for recovery depends on the degree of impact (number and size of impoundments and length of time impoundments have existed) and stream gradient. Higher gradient streams are generally able to flush accumulated silt and sediment more effectively. Increased soil moisture both within and surrounding beaver-flooded areas can also result in reduced

timber growth and mast production and an increase in bank destabilization.

Musk rats have been known to disturb the normal ecology of a marsh due to the over-consumption of marsh plants. A type of “marsh eat-out” similar to damage caused by blue and snow geese results when muskrats are allowed to overpopulate (Lynch 1947).

1.2.5 Need for Beaver and Muskrat Damage Management to Protect Public Health and Safety

When requested, Nebraska WS assists the [REDACTED] agencies to monitor and reduce the risk of disease transmission. In certain situations, beaver and muskrat can become a threat to public health and safety (e.g., burrowing into or flooding of roadways and railroad beds can result in serious accidents) (Miller 1983, Woodward 1983). An airport authority in Nebraska requested assistance to reduce safety risks with beaver damming a drainage ditch on the airfield property. Wildlife hazards to aircraft and subsequent risks to public safety are the most serious of wildlife concerns regarding aviation. Birds frequent airports because they provide food, water and shelter...flocking birds pose the greatest threat to active aircraft. (Luchsinger 1997) Beaver dams can back water onto an airfield, creating habitat attractive to wildlife and generating a public health and safety hazard.

Increased water levels in urban areas resulting from beaver activity can lead to unsanitary conditions and potential health problems from flooded septic systems and sewage treatment facilities (DeAlmeida 1987, Loeb 1994). Beaver damming activity also creates conditions favorable to mosquitoes and can result in population increases of these insects (Wade and Ramsey 1986). While the presence of these insects is largely a nuisance, mosquitoes can transmit diseases, such as encephalitis (Mallis 1982). In addition, beaver, which are carriers of the intestinal parasite *Giardia lamblia*, can contaminate human water supplies and cause outbreaks of the disease Giardiasis in humans (Woodward 1983, Beach and McCulloch 1985, Wade and Ramsey 1986, Monzinger and Hibler 1987). Beaver are also known carriers of tularemia, a bacterial disease, that is transmittable to humans through bites by insect vectors or infected animals or by handling animals or carcasses that are infected (Wade and Ramsey 1986). Skinner et al. (1984) found that in cattle-ranching sections of Wyoming the fecal bacterial count was much higher in beaver ponds than in other ponds, something that can be a concern to ranchers and recreationists.

In Nebraska, muskrats were living in a railroad right-of-way and burrowing dens along the track beds of a major railroad. The weight of the rail cars would cause the tracks to settle, resulting in continual maintenance costs and the possibility of a train derailment. (Internal Memorandum 1989)

1.3 OBJECTIVES

- 1.3.1** Respond to 100% of the requests for assistance with the appropriate action (technical assistance or direct control) as determined by Nebraska ADC personnel, applying the ADC Decision Model (Slate et al. 1992).
- 1.3.2** Resolve all beaver and most muskrat damage problems within two weeks.
- 1.3.3** Maintain the lethal take of non-target animals by Nebraska WS personnel during damage management to less than 2% of the total animals taken.

1.4 ENVIRONMENTAL ASSESSMENT RELATIONSHIP TO OTHER ENVIRONMENTAL

DOCUMENTS

1.4.1 ADC Program Programmatic EIS. WS has issued a final EIS (USDA 1994) and Record of Decision on the National APHIS-WS program. This EA is tiered to that EIS.

1.4.2 National Forest Land and Resource Management Plans (LRMPs). The National Forest Management Act requires that each National Forest prepare a LRMP for guiding long range management and direction. LRMP documents and the decision made from this EA need to be consistent.

1.4.3 [REDACTED]. The [REDACTED] currently uses [REDACTED] or [REDACTED] to guide management on lands they administer. [REDACTED] generally replace older land use plans known as [REDACTED]. [REDACTED] and [REDACTED] documents and the decision made from this EA need to be consistent.

1.5 **RELATIONSHIP OF AGENCIES DURING PREPARATION OF THIS ENVIRONMENTAL ASSESSMENT**

Based on agency relationships, Memorandum of Understandings (MOUs) and legislative authorities, Nebraska WS is the lead agency for this EA and is therefore responsible for the scope, contents and decisions made. The Forest Service, U.S. Fish and Wildlife Service (USFWS), [REDACTED], U.S. Army Corps of Engineers (USACE), Nebraska Natural Resource Commission (NRC), Nebraska Association of Resource Districts (NARD), Natural Resource Districts (NRD), Nebraska Game and Parks Commission (NGPC), Nebraska Department of Roads (NDOR), [REDACTED] ([REDACTED]), University of Nebraska Cooperative Extension (UNCE) and Nebraska Department of Natural Resources (DNR) had input during the EA preparation to ensure an interdisciplinary approach in compliance with the National Environmental Policy Act (NEPA) and agency mandates, policies, and regulations.

1.6 **SCOPE OF ENVIRONMENTAL ASSESSMENT ANALYSIS**

1.6.1 Actions Analyzed. This EA evaluates planned and anticipated beaver and muskrat damage management to protect: 1) agriculture, 2) property, 3) natural resources, and 4) public health and safety in Nebraska. Additional NEPA documentation would be required to conduct wildlife damage management that is outside the scope of this EA, should the need arise.

1.6.2 Counties Not Part of the Operational WS Program. Some counties in Nebraska do not have Cooperative Agreements with WS. Because the current program's mission is to provide assistance when requested and where funds are available, this EA analyzes a potential statewide program. Should nonparticipating counties or currently nonparticipating resource owners/managers in cooperating counties decide to enter the program, this EA would sufficiently provide analysis. Currently, WS does deliver limited direct operational damage management and technical assistance support in non-cooperating counties.

1.6.3 Wildlife Species and Habitats Potentially Protected by Nebraska WS. Nebraska WS beaver and muskrat damage management assistance may be requested to achieve management objectives for specific wildlife species (including threatened and endangered (T&E) species) or for wildlife habitat. If other needs are identified, a determination of the need for additional NEPA analysis would be made on a case-by-case basis.

1.6.4 American Indian Lands and Tribes. Currently, Nebraska WS does not have an MOU with any

of the tribes in Nebraska. If a tribe enters into a MOU, this EA would be reviewed to ensure compliance with NEPA.

1.6.5 Period for Which this EA is Valid. This EA would remain valid until it is determined that new needs for action, changed conditions or new alternatives having different environmental effects precondition

further analysis. At that time, this assessment would be re-analyzed pursuant to NEPA. Review of this EA will be conducted annually and, if necessary, supplemented to ensure NEPA sufficiency.

1.6.6 Site Specificity. This EA addresses all lands under cooperative agreement, agreement for control, WS Work Plans or other comparable documents in Nebraska. These lands are under the jurisdiction of federal, state, tribal, county, municipal and private administration/ownership. It also addresses the impacts of beaver and muskrat management on areas where additional agreements may be signed in the future. It is conceivable that additional wildlife damage management efforts could occur considering the proposed action is to reduce beaver and muskrat damage and because the program's goals and directives are to provide services when requested, within available funding and workforce,. Thus, this EA anticipates this potential expansion and analyzes the impacts of such efforts as part of the program. This EA emphasizes major issues as they relate to specific areas whenever possible, however, many issues apply wherever wildlife damage and resulting management occur, and are treated as such. The standard ADC Decision Model (Slate et al. 1992, USDA 1994:2-23, and WS Directive 2.105) would be the site-specific procedure for individual actions conducted by WS in Nebraska (see Chapter 3 for a description of the ADC Decision Model and its application).

The primary purpose for preparing an EA in compliance with NEPA is to determine if a federal proposal could have a significant impact on the quality of the human environment. In order to determine significance, WS analyzed the proposed action and alternatives against the issues that were raised during the interdisciplinary and public involvement processes. These issues were analyzed at levels that are "*site specifically*" appropriate for each. In determining significance, this requires that WS look at the *context* of the issue and *intensity* of the impact. WS determined that its analysis would be adequate because further site-specific information would not change the analysis, add to the public's understanding of the proposal, or provide additional useful or relevant information to the decision maker (Eccleston 1995).

WS' mission is to reduce wildlife damage, not wildlife. Like other damage management organizations (fire departments, emergency clean-up organizations, etc.), WS can sometimes predict the locations and types of needs and risks that could take place to reduce damage and consider the plausibility of damage at a given location. WS can-not, however, predict the exact locations or needs that may be required to reduce wildlife damage risks. WS cannot predict exactly where damage will occur, nor to prevent it without being far more destructive than is prudent. This phenomenon would be like a fire department determining where the next fire will occur. As is true with the other damage organizations and situations, WS can and does provide in the EA the impacts of the damage when it occurs and the forms it takes, and the impacts of reducing wildlife damage within the area being protected. The site specificity problem occurs when trying to determine exactly the location and animals that are specifically, or would be specifically involved, in a damage situation before it occurs.

WS recognizes that beaver and muskrat have no *intent* to do harm. They inhabit (i.e., reproduce, forage, deposit waste) habitats they find suitable. When these actions occur in the *wrong* place, humans call this damage. *Wrong* places, unfortunately, are determined not merely in spacial terms, but also have elements of time and other activities that define their *wrongness*. (Example: a beaver living in the wilds of

Nebraska may not be a problem while one plugging a road culvert and causing flooding and weakening of the road bed could be a problem.) When WS is requested to determine exactly where this will occur, WS is being held to a standard that no other damage management agency or entity, nor even any wildlife management agency, is required to meet or could do. In fact, despite similar language to NEPA in the California Environmental Quality Administration requirements, the California Game and Fish Department was only required to address the impacts to the population being impacted. Beaver or muskrat populations are rarely confined to a few acres of property, but extend over a broader area. This approach recognizes the biological reality of what WS as a program needs to consider. With this said, WS is aware that damage situations with each individual beaver or muskrat may change at any time in any location. WS has prepared documentation that provides as much information as possible to address and predict the locations of potentially problem animals and impacts to populations of beaver and muskrats that could be involved in causing damage or threats to human interests and needs.

1.6.7 Public Involvement. A Multi-agency Team of personnel from WS, Forest Service, [REDACTED], USFWS, USACE, NGPC, [REDACTED], NDOR, HHS, DNR, and UNCE were invited to refine issues related to the proposed action, prepare objectives and identify preliminary alternatives. Due to interest in the Nebraska WS Program, the Multi-agency Team concurred that Nebraska WS include an invitation for public comment in this EA process. An invitation for public comment letter containing issues, objectives, preliminary alternatives, and a summary of the need for action, was sent to 166 individuals or organizations who had identified an interest in Nebraska WS beaver and muskrat management program. Notice of the proposed action and invitation for public involvement were placed in 5 newspapers with circulation throughout Nebraska. Public comments were documented from numerous letters or written comments. The responses represented a wide range of opinions, both supporting and opposing the proposal or parts of the proposal. All comments were analyzed to identify new issues, alternatives, or to redirect the objectives of the program. All responses are maintained in the administrative file at the Nebraska WS State Office, P.O. Box 81866, Lincoln, Nebraska 68501-1866.

1.7 REMAINING ENVIRONMENTAL ASSESSMENT BRIEFING

The remainder of this EA is composed of four chapters and three appendices. Chapter 2 discusses and analyzes the issues and affected environment. Chapter 3 contains a description of each alternative, alternatives not considered in detail, mitigation and standard operating procedures (SOP). Chapter 4 analyzes consistency with public land management agency management plans, environmental consequences and the environmental impacts associated with each alternative considered in detail. Chapter 5 contains the list of preparers of this EA. Appendix A is the literature cited in this EA, Appendix B is the authorities for conducting wildlife damage management in Nebraska and Appendix C is a detailed description of the methods used for beaver and muskrat damage management in Nebraska.

CHAPTER 2: ISSUES AND AFFECTED ENVIRONMENT

2.0 INTRODUCTION

Chapter 2 contains a discussion of the issues, including issues that will receive detailed environmental impacts analysis in Chapter 4 (Environmental Consequences), issues that were used to develop mitigation measures and SOPs, and issues that will not be considered in detail, with the rationale. Pertinent portions of the affected environment will be included in this chapter in the discussion of issues used to develop mitigation measures. Additional affected environments will be incorporated into the discussion of the environmental impacts in Chapter 4 and the description of the current program (the "No Action" Alternative) in Chapter 3.

Issues are concerns of the public and/or of professional communities about potential environmental problems that might occur from a proposed federal action. Such issues must be considered in the NEPA decision process. Issues relating to the management of wildlife damage were raised during the scoping process in preparing the programmatic WS EIS (USDA 1994) and were considered in the preparation of this EA. These issues are fully evaluated within the EIS, which analyzed data specific to the Nebraska WS Program

2.1 ISSUES ANALYZED IN DETAIL IN CHAPTER 4

The Multi-agency Team, consisting of representatives from the lead (WS) and cooperating agencies (Forest Service, ■■■■, USFWS, USACE, NGPC, ■■■■, NDOR, HHS, DWR, and the UNCE) determined the issues to be:

- Concerns for the Nebraska WS kill of beaver and muskrat to cause population declines, when added to other mortality.
- Concerns about the selectivity and effectiveness of beaver and muskrat damage management.
- Concerns about the effects of Nebraska WS beaver and muskrat damage management on public health and safety.

Potential environmental impacts of the Proposed Action and Alternatives in relation to these issues are discussed in Chapter 4 - Environmental Consequences. As part of this process, and as required by the Council on Environmental Quality (CEQ) and APHIS NEPA implementing regulations, this document and its Decision are being made available to the public through "Notices of Availability" (NOAs) published in local media. New issues or alternatives raised after publication of public notices will be fully considered to determine whether the EA and its Decision should be revisited, and if appropriate, revised.

2.2 ISSUES USED TO DEVELOP MITIGATION

2.2.1 Beaver and Muskrat Management in Special Management Areas

Many areas on federal and state managed lands within Nebraska have a special designation and/or require special management consideration. These include Wilderness Areas (WA), Research Natural Areas (RNA), Wild and Scenic Rivers (WSR), Wildlife Management Areas (WMA) and State Recreation Areas (SRA). The special management required for each of these different areas varies considerably by designation and land administrator and as directed by different legal mandates.

WS has conducted some wildlife damage management activities in special management areas in the past. WS acknowledges that recreationists and others may consider these activities to be an invasion of solitude and an adverse affect on the aesthetic quality of their experience.

WS conducts beaver or muskrat damage management on areas with special designations only in limited instances, when and where a specific need is identified, only when allowed under the provisions of the specific management designation, and with the concurrence of the land management agency. WS activities in special management areas have historically been, and are expected to continue to be, a minor part of the overall WS program. Restrictions on WS activities are listed in Chapter 3.

Federal Lands Special Management Areas

Wilderness Areas: WAs are areas designated by Congress to be managed for the preservation of wilderness values. Wildlife and fish damage management follows the guidance of Forest Service Manual (FSM) 2151, FSM 2323, and FSM 4063 for management of wildlife or fish damage in wilderness and RNA. Animal damage management is permitted in wilderness when it: is used before wilderness designation, conforms with direction in FSM 2323.33 on resources management in wilderness, and is needed for the recovery of federally listed T&E species. WAs in Nebraska are listed in Table 2-1.

Table 2-1. Wilderness Areas in Nebraska

Wilderness Area	Acres

Research Natural Areas: RNAs are part of a national network of ecological areas designated in perpetuity for research and education and/or to maintain biological diversity on National Forest System lands. RNAs are managed for the protection of unusual, scientific, or special interest natural characteristics for research and education. *Establish Records* have been approved for the RNAs listed in Table 2-2 for the Nebraska National Forest. The RNAs would be managed according to the Nebraska National Forest Plan. The management goal is to maintain these areas in their natural condition to be used for non-manipulative research and observation.

Table 2-2. Research Natural Areas in Nebraska

Research Area	Acres

Wild and Scenic Rivers: WSRs are rivers and streams that must be free-flowing, and with their adjacent land area, must possess one or more “*outstandingly remarkable*” values. Scenic, geologic, historic, cultural, ecologic, or fish and wildlife habitat are examples of such values. *Wild Rivers* are those rivers or sections of river that are free of impoundments, generally accessible only by trail, with the watershed or shorelines essentially primitive and water unpolluted. *Scenic Rivers* are those rivers or sections of river that are free of impoundments, with shorelines and watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads. *Recreational Rivers* are those rivers or sections of rivers that are readily accessible by roads, have some development along their shorelines and may have some history of impoundment or diversion. Nebraska’s WSRs are listed in Table 2-3.

Table 2-3. Wild and Scenic Rivers in Nebraska

Waterbody	Class	Miles
Niobrara River (Borman Bridge to Hwy 137)	Scenic	76 miles
Niobrara River (Knox County)	Recreational	25 miles
Verdigre Creek (Verdigre to Niobrara River)	Recreational	6 miles
Missouri River (Ft. Randall Dam to Lewis and Clark Lake)	Recreational	39 miles

2.2.2 Humaneness of Methods Used by WS

The issue of humaneness, as it relates to the killing or capturing of wildlife, is an important but complex concept. Kellert and Berry (1980) in a survey of American attitudes toward animals related that 58% of their respondents, “*. . . care more about the suffering of individual animals . . . than they do about species population levels.*” Schmidt (1989) indicated that vertebrate pest control for societal benefits could be compatible with animal welfare concerns if “*. . . the reduction of pain, suffering, and unnecessary death is incorporated in the decision making process.*”

Suffering has been described as a “*. . . highly unpleasant emotional response usually associated with pain and distress.*” However, suffering “*. . . can occur without pain . . .*,” and “*. . . pain can occur without suffering . . .*” (American Veterinary Medical Association (AVMA) 1987). Because suffering carries with it the implication of a time frame, a case could be made for “*. . . little or no suffering where death comes immediately . . .*” (California Department of Fish and Game (CDFG) 1991).

Defining pain as a component of humaneness may be a greater challenge than that of suffering. Pain obviously occurs in animals. Altered physiology and behavior can be indicators of pain and identifying the causes that elicit pain responses in humans would “*. . . probably be causes for pain in other animals . . .*” (AVMA 1987). However, pain experienced by individual animals probably ranges from little or no pain to significant pain (CDFG 1991). Thus, WS damage management methods, such as leg-hold traps and body snares, may cause varying degrees of pain in different animal species held for varying time frames. At what point pain diminishes or stops under these types of restraint has not been measured by the scientific community.

Pain and suffering, as it relates to a review of WS damage management methods to capture animals, has

both a professional and lay point of arbitration. Wildlife managers and the public would both be better served to recognize the complexity of defining suffering since " . . . *neither medical or veterinary curricula explicitly address suffering or its relief*" (CDFG 1991).

Research suggests that with some methods, such as restraint in leg-hold traps, changes in the blood chemistry of trapped animals indicate "*stress*" (USDA 1994:3-81). However, such research has not yet progressed to the development of objective, quantitative measurements of pain or stress for use in evaluating humaneness.

The NGPC and HHS are authorized by law to protect the public from health risks and dangerous situations caused by diseases associated with wildlife. The suffering or discomfort endured by the public because of human injury or death associated with beaver or muskrat damage is unacceptable to most people.

Thus, the decision-making process involves tradeoffs between the above aspects of pain and humaneness. An objective analysis of this issue must consider not only the welfare of wild animals but also the welfare of humans if damage management methods were not used. Therefore, humaneness appears to be a person's perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently. The challenge in coping with this issue is how to achieve the least amount of suffering within the constraints imposed by current technology, workforce and funding.

WS has improved the selectivity and humanness of management devices through research and is striving to bring new findings and products into practical use. Until new findings and products are found practical, a certain amount of animal suffering could occur when some methods are used in those situations when non-lethal damage management methods are not practical or effective.

Nebraska WS personnel are experienced and professional in their use of management methods so that they are used as humanely as possible under the constraints of current technology, workforce and funding. Mitigation measures/SOPs used to maximize humaneness are listed in Chapter 3.

2.2.3 Cultural and Historical Resources

American Indian Concerns

The National Historical Preservation Act of 1966, as amended, requires federal agencies to evaluate the effects of any federal undertaking on cultural resources and to consult with appropriate American Indian Tribes to determine whether they have concerns for cultural properties in areas of federal undertakings. The Native American Graves Protection and Repatriation Act of 1990 provides for protection of American Indian burials and establishes procedures for notifying tribes of any new discoveries.

In consideration of American Indian cultural and archeological interests, the Nebraska WS program solicited input from the following tribes:

Ogallala Sioux Tribe
Omaha Tribe
Ponca Tribe of Nebraska

Santee Sioux Tribe
Winnebago Tribe
Sac and Fox Tribe of Missouri
Iowa Tribe of Kansas and Nebraska

Each tribe was asked to identify concerns relating to the proposed WS program through an *invitation for public comment* letter. No tribe responded with concerns.

Other Cultural and Historical Resources

Concurrence of no impact to properties on or eligible for the National Registry of Historical Places relative to the current program and the proposed action has been received from the Nebraska State Historical Preservation Office (Steinacher and Puschendorf 1999). In most cases, beaver or muskrat damage management has little potential to cause adverse effects to sensitive cultural resources. The areas where beaver or muskrat damage management would be conducted are small and damage management activities cause minimal ground disturbance. Mitigation measures developed to avoid impacts to these sites are listed in Chapter 3.

2.2.4 Environmental Justice and Executive Order 12898 - “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations”

Environmental Justice (EJ) is a movement promoting the fair treatment of people of all races, income and culture with respect to the development, implementation and enforcement of environmental laws, regulations and policies. Fair treatment implies that no person or group of people should endure a disproportionate share of the negative environmental impacts resulting either directly or indirectly from the activities conducted to execute this country's domestic and foreign policies or programs. EJ has been defined as the pursuit of equal justice and equal protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status. The EJ movement is also known as Environmental Equity -- which is the equal treatment of all individuals, groups or communities regardless of race, ethnicity, or economic status, from environmental hazards.

All APHIS-WS activities are evaluated for their impact on the human environment and compliance with Executive Order 12898 to ensure EJ. WS personnel use wildlife damage management methods as selectively and environmentally conscientiously as possible. All chemicals used by APHIS-WS are regulated by the Environmental Protection Agency (EPA) through Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), by the NDA, by MOUs with federal land management agencies, and by WS Directives. Based on a thorough Risk Assessment, APHIS concluded that when WS program chemicals are used following label directions, they are selective to target individuals or populations and such use has negligible impacts on the environment (USDA 1994, Appendix P). The APHIS-WS operational program, discussed in this document, properly disposes of any excess solid or hazardous waste. It is not anticipated that the proposed action would result in any adverse or disproportionate environmental impacts to minority and low-income persons or populations.

2.2.5 Protection of Children from Environmental Health and Safety Risks (Executive Order 13045).

Children may suffer disproportionately from environmental health and safety risks for many reasons, including their developmental physical and mental status. Because WS makes it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children, WS has

considered the impacts that this proposal might have on children. The proposed beaver and muskrat damage management would occur by using only legally available and approved damage management methods where it is highly unlikely that children would be adversely affected. For these reasons, WS concludes that it would not create an environmental health or safety risk to children from implementing this proposed action.

2.3 ISSUES NOT CONSIDERED IN DETAIL WITH RATIONALE

2.3.1 No Wildlife Damage Management at Taxpayer Expense; Wildlife Damage Management Should be Fee Based

Funding for WS comes from a variety of sources in addition to federal appropriations. Nebraska state, county, and city funds from private organizations are applied to the program under Cooperative Agreements. Federal, state, and local officials have decided that wildlife damage management should be conducted by appropriating funds. WS was established by Congress as the agency responsible for providing wildlife damage management to the people of the United States. Wildlife damage management is an appropriate sphere of activity for government programs, because aspects of wildlife damage management are a government responsibility and directed by law.

2.3.2 Translocation of Wildlife Should Not be Used

Nebraska WS could elect to use translocation as a damage management method if such activities are according to laws and regulations of the NGPC (WS Directive 2.501). However, translocation of wildlife as a damage management method is used infrequently. Translocation could be part of IWDM and selection for use would follow criteria in the WS Decision Model (Slate et al. 1992).

Translocation may be appropriate in some situations, however, beaver and muskrat are relatively abundant in much of the suitable habitat in Nebraska. Translocation is not necessary for the maintenance of viable populations, and live trapping and relocating beaver or muskrat is reported to be uneconomical and biologically unsound (Wade and Ramsey 1986). Hibbard (1958) in North Dakota recorded an average dispersal distance by 17 relocated beaver to be about 9 miles. Beavers translocated on streams and later recaptured (N=200) moved an average distance of 4.6 miles. Beavers translocated to lakes and potholes (N=272) moved an average of 2 miles. Any decisions on translocation of beaver or muskrat would be coordinated with NGPC officials and landowners.

The AVMA, the National Association of State Public Health Veterinarians, and the Council of State and Territorial Epidemiologists oppose the translocation of mammals because of the risk of disease transmission (Center for Disease Control 1990). Although translocation is not necessarily precluded in all cases, it would in many cases be logistically impractical and biologically unwise.

2.3.3 Concern About the Effects of Beaver Dam Breaching Activities on Wetland Wildlife and Habitat

The primary source of beaver damage is from water impoundments created by beaver-constructed dams consisting of mud, sticks and other vegetative materials.

WS beaver damage management activities are primarily conducted to alleviate damage to agricultural crops, timber resources, and public property such as roads, bridges and water management facilities. Activities are also conducted to enhance or reclaim wildlife and stream fishery habitats. WS operations

routinely incorporate population reduction with dam breaching and/or installation of temporary water leveler or exclusion devices. Dams are often breached by hand or small charges of binary explosives if necessary. No heavy equipment such as backhoes or bulldozers are used by WS in these damage reduction and wildlife enhancement activities. These activities take place on small watershed streams, tributary drainages, and ditches and can best be described as small, one-time projects conducted to restore water flow through previously existing channels. Only that portion of the dam blocking the stream or ditch channel is altered or breached. WS has adopted USACE criteria (Appendix C) that will be implemented during dam-breaching activities to minimize any impacts to the water course basin, adjacent riparian areas, or surrounding vegetation. These projects are all conducted by trained WS certified explosive specialists. After a blast, any remaining fill material still obstructing the channel is normally washed downstream by water current. The only noticeable side effects from this activity are diluted mud, water, and small amounts of debris from the dam scattered around the blasting site. Less than 10 cubic yards of material is moved in each of these project activities.

CHAPTER 3: ALTERNATIVES

3.0 INTRODUCTION

This chapter consists of four parts: 1) an introduction, 2) a description of alternatives considered and analyzed in detail including the Proposed Action (Alternative 1), 3) a description of alternatives considered, but eliminated from detailed analysis, and 4) a table of mitigation measures and SOPs. Alternatives were developed for consideration using the WS Decision Model (Slate et al. 1992), “*Methods of Control*” (USDA 1994 Appendix J) and the “*Risk Assessment of Wildlife Damage Control Methods Used by the USDA Animal Damage Control Program*” (USDA 1994, Appendix P). Four alternatives were recognized, developed, and analyzed in detail by the Multi-agency Team (WS, Forest Service, ■■■■, USFWS, USACE, NDOR, ■■■■, NGPC, HHS, UNCE, DWR); four alternatives were considered but not analyzed in detail with supporting rationale (Section 3.5). The four alternatives analyzed in detail are:

- 1) Alternative 1 - Continue the Current Nebraska WS Program: (Proposed, No Action). This alternative would continue beaver and muskrat damage management based on the needs of multiple resources (agricultural and natural resources, roadways and bridges, railroad beds, property,, and public health and safety). Damage management programs would be implemented following consultations with the NGPC, federal agencies, or tribes as appropriate. This alternative would allow for a program to protect multiple resources as requested on lands owned or managed by the federal or state management agencies, privately owned lands and tribal lands if a Cooperative Agreement, Agreement for Control, MOU, or other comparable document with Nebraska WS are in place.

- 2) Alternative 2 - No Federal Nebraska WS Program. This alternative would terminate the federal beaver and muskrat damage management program in Nebraska.
- 3) Alternative 3 - Technical Assistance Only. Under this alternative, Nebraska WS would not conduct operational beaver or muskrat damage management in Nebraska. The entire program would consist of only technical assistance.
- 4) Alternative 4 - Non-lethal Beaver and Muskrat Damage Management Only. Under this alternative, Nebraska WS would only utilize non-lethal methods for the management of beaver or muskrat damage in Nebraska.

3.1 DESCRIPTION OF THE ALTERNATIVES

3.1.1 Alternative 1 - Continue the Current Nebraska WS Program: (No Action)

The No Action alternative is a procedural NEPA requirement (40 CFR 1502.14(d)), is a viable and reasonable alternative that could be selected and serves as a baseline for comparison with the other alternatives. The No Action alternative, as defined here, is consistent with CEQ (1981).

Overview

The No Action alternative would continue the current Nebraska WS beaver and muskrat damage management program primarily for the protection of roadways, and agricultural and natural resources. The current program is a collection of cooperative programs with federal, state and local agencies, and private individuals and associations to protect roadways and crops (described in Chapter 1). Nebraska WS conducts technical assistance and operational preventive beaver and muskrat damage management (as indicated by historical loss data) and corrective beaver and muskrat damage management (in response to current loss, hazard or public safety) on federal, state, tribal, county and private lands under MOU, Cooperative Agreements, Agreements for Control, or other comparable documents. All damage management is based on interagency relationships, which require close coordination and cooperation because of overlapping authorities. Nebraska WS has several MOUs with agencies such as the Forest Service, ■■■■, ■■■■, NGPC, HHS, and UNCE to provide direction for program activities. Nebraska WS has Cooperative Agreements with federal, state, county, and city governments, and individuals to conduct wildlife damage management.

Before management would be conducted on private lands, *Agreements for Control on Private Property* that describe the methods to be used and the species to be managed are signed with the landowner or manager. For federal lands, Nebraska WS coordinates damage management activities with the land management agency. Management is directed toward localized populations, groups, and/or individual animals, depending on the circumstances.

3.1.2 Alternative 2 - No Federal Nebraska WS Program

This alternative would eliminate all Nebraska WS beaver and muskrat damage management (operational and technical assistance) on all lands in Nebraska. However, state and county agencies and private individuals could conduct beaver and muskrat damage management. Nebraska WS would not be available to provide technical assistance or make recommendations.

Due to interest in this alternative, an analysis has been included. A “No Program” alternative was evaluated in USDA (1994).

3.1.3 Alternative 3 - Technical Assistance Only

This alternative would eliminate WS operational beaver and muskrat damage management in Nebraska. Nebraska WS personnel would only provide technical assistance and make recommendations when requested. However, private landowners, contractors, or others could conduct their own damage management on federal, state, county, and private lands.

The “*technical assistance only*” alternative would place the immediate burden of operational damage management work on other federal, state or county agencies, and property owners. Individuals experiencing beaver and muskrat damage would, independently or with Nebraska WS recommendations, carry out and fund damage management activities. Individuals or agencies could implement damage management as part of the cost of doing business or assume a more active role in providing operational damage management. If this alternative was selected, Nebraska WS would not, however, direct how state or county agencies or property owners would implement damage management. Some agencies or property owners might choose not to take action to resolve beaver or muskrat damage while other situations might warrant the use of legally available management methods because of public demands.

3.1.4 Alternative 4 - Non-lethal Beaver and Muskrat Damage Management Only.

This alternative would not allow the use of lethal methods by WS as described under the proposed action to relieve damage caused by beaver or muskrats. Resource owners or managers would still have the option of implementing non-lethal and lethal control measures and WS would continue to recommend them where appropriate, but no preventive lethal damage management would be allowed. However, personnel experienced in beaver and muskrat damage management generally know when and where non-lethal damage management techniques would work; this alternative could result in the use of methods that are known to be ineffective in particular situations.

3.2 BEAVER OR MUSKRAT DAMAGE MANAGEMENT STRATEGIES AND METHODOLOGIES USED BY WILDLIFE SERVICES.

The strategies and methodologies described below are common to Alternatives 1 and 4 of this EA. Under Alternative 3, WS personnel would only make technical assistance recommendations to requesters based on practical and legal strategies supported by the WS Decision Model (Slate et al. 1992). Alternative 2 would terminate both WS technical assistance and operational beaver and muskrat damage management in Nebraska.

3.2.1 Integrated Wildlife Damage Management

During more than 80 years of resolving wildlife damage problems, WS has considered, developed, and used numerous methods of managing damage problems (USDA 1994:3). WS’ efforts have involved the research and development of new methods and the implementation of effective strategies to resolve and prevent wildlife damage.

Usually, the most effective approach to resolving wildlife damage is to integrate the use of several methods simultaneously or sequentially. IWDM is the implementation and application of safe and practical methods for the prevention and reduction of damage caused by wildlife based on local problem

analyses and the informed judgement of trained personnel. The WS Program applies IWDM, commonly known as Integrated Pest Management (WS Directive 2.105), to reduce damage through the WS Decision Model (Slate et al. 1992) discussed on page 3-4.

The philosophy behind IWDM is to implement effective management techniques in a cost-effective manner while minimizing the potentially harmful effects to humans, target and non-target species, and the environment. IWDM draws from the largest possible array of options to create a combination of techniques for specific situations. IWDM may incorporate cultural practices, habitat modification, animal behavior modification, removal of individual animals, local population reduction, or any combination of these, depending on the characteristics of the specific damage problems.

3.2.2 Integrated Beaver or Muskrat Damage Management Strategies used by Wildlife Services

- **Technical Assistance** (implementation is the responsibility of the requester): WS personnel provide information, instructional sessions, demonstrations and advice on available beaver and/or muskrat damage management techniques. Technical assistance includes demonstrations on the proper use of management devices (conibear traps, leg-hold traps, tree-wraps, etc.) and information on pond levelers, wildlife habits, habitat management, and animal behavior modification. Technical assistance is generally provided following an on-site visit or verbal consultation with the requester. Generally, several management strategies are described to the requester for short and long-term solutions to damage problems; these strategies are based on factors such as need and practical application. Technical assistance may require substantial effort by WS personnel in the decision making process, but the actual management work is the responsibility of the requester.
- **Direct Damage Management Assistance** (management conducted or supervised by WS personnel): Direct damage management assistance is implemented when the problem cannot be resolved through technical assistance and when Cooperative Agreements provide for WS operational assistance. The initial investigation explores and defines the nature and history of the problem, extent of damage, and the species responsible for the damage. Professional skills of WS personnel are often required to resolve problems effectively and safely, especially if restricted use pesticides are required or if the problem requires the direct supervision of a wildlife professional. WS considers the biology and behavior of the damaging species, and other factors using the WS Decision Model (Slate et al. 1992). The recommended strategy(ies) may include any combination of preventive (generally implemented by the property owner) and corrective (generally implemented by WS) actions. Corrective damage management is applying management techniques to stop or reduce current losses. As requested and appropriate, WS personnel may provide information, conduct demonstrations, or take action to prevent additional losses from recurring.

3.2.3 Decision Making

The procedures used by WS personnel to determine management strategies or methods applied to specific damage problems can be found in USDA (1994, Appendix N).

The WS Decision Model (Figure 3-1) considers the following factors before selecting or recommending damage management methods and techniques:

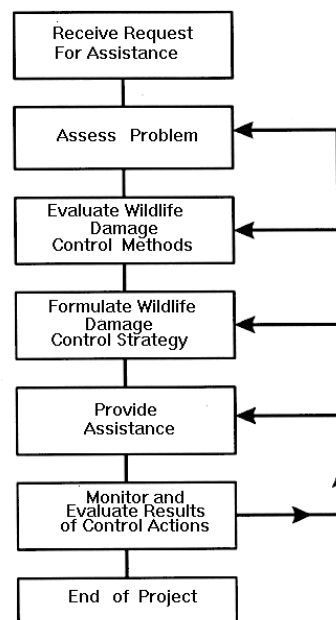
- Species responsible for the damage
- Magnitude, geographic extent, frequency, history and duration of the problem
- Status of target and non-target species, including T&E species
- Local environmental conditions
- Potential biological, physical, economic, and social impacts
- Potential legal restrictions
- Costs of damage management options²

The decision-making process is used to evaluate and respond to damage complaints. WS personnel are frequently contacted after requesters have tried non-lethal techniques and found them to be inadequate for reducing damage to an acceptable level. Personnel assess the problem and methods are evaluated for their availability (legal and administrative) and suitability based on biological, economic and social considerations.

Following this evaluation, the methods deemed to be practical for the situations are formed into a management strategy. After the management strategy has been implemented, monitoring and evaluation of the strategy is conducted to assess the effectiveness of the strategy. If the strategy is effective, the present need for management is ended.

When damage continues intermittently over time, WS personnel and the requester monitor and reevaluate the situation. If one method or combination of methods fail to stop damage, a different strategy is implemented. In terms of WS' Decision Model (Slate et al. 1992), most damage management efforts consist of a continuous feedback loop between receiving the request and monitoring the results, with the damage management strategy reevaluated and revised periodically.

Figure 3-1. Wildlife Services Decision Model



3.3 BEAVER OR MUSKRAT DAMAGE MANAGEMENT METHODS AUTHORIZED FOR USE OR RECOMMENDED

USDA (1994, Appendix J) describes methods currently used by the WS program. Several of these were considered

²The cost of management may sometimes be secondary because of overriding environmental, legal, human health and safety, animal welfare or other concerns.

in this assessment because of their potential use in managing beaver damage to roads, natural and agricultural resources, sensitive plant and animal habitats and public health and safety. A listing and more detailed description of the methods used by Nebraska WS for beaver and muskrat damage management is found in Appendix C of this EA.

3.3.1 Non-lethal Beaver or Muskrat Damage Management Methods:

Habitat Management refers to riparian vegetation manipulation to reduce the carrying capacity for beaver or muskrats. Habitat management may also involve manipulating beaver impoundment water levels to reduce damage or conflict caused by flooding.

Pond levelers are installed to regulate and reduce the volume of water contained by a beaver dam; they can be effective in reducing flooding in certain situations (Minn. Dept. Nat. Res. 1994).

Exclusion involves preventing beaver or muskrats from gaining access to protected resources (i.e., tree wraps, grit paint, or fencing, etc).

Beaver Dam Breaching involves the removal of debris deposited by beaver to impede the flow of water, either with the use of binary explosives or by hand.

Live Beaver traps are designed to live-capture beaver for relocation.

Leg-hold traps can be effectively used to live-capture a variety of mammals, although most beaver and muskrats are not. Effective trap placement and use of appropriate lures and placement by trained WS personnel contribute to the leg-hold trap's selectivity.

Snares are capture devices consisting of a cable loop and a locking device that are placed in travel ways. Most snares are also equipped with a swivel to minimize cable twisting and breakage.

3.3.2 Lethal Damage Management Methods

These methods involve damage management specifically designed to lethally reduce beaver or muskrat densities in certain situations to a level that stabilizes, reduces, or eliminates damage. The level of population reduction necessary to achieve a reduction of damage varies according to the resource protected, habitat, population, the effectiveness of other damage management strategies, and other population factors.

Shooting is selective for the target species and may involve the use of spotlights and either a shotgun or rifle.

Body-grip traps are kill traps designed to cause the quick death of the animal that activates the trap. The 330 size body-grip trap is used exclusively for beaver in aquatic habitats, with placement depths varying from a few inches to several feet below the water surface.

Chemical Management Methods:

All chemicals used by Nebraska WS are registered under FIFRA and administered by the EPA and the NDA or are approved by the Food and Drug Administration (FDA). All WS field personnel in Nebraska are certified as restricted-use pesticide applicators by the NDA. No chemicals are used on public or private lands without

authorization from the land management agency or property owner/manager. The only chemical method currently authorized for use for muskrat damage management in Nebraska is:

Zinc phosphide - Zinc Phosphide Concentrate for Rodent and Lagomorph (EPA Reg. No. 56228-6) is registered in Nebraska with the NDA. This label includes use restrictions for the control of muskrats and reduce muskrat damage. Treated bait (e.g., carrots, sweet potatoes, apples, pears) can only be applied, after the acceptance of pre-bait, on rafts in large waterways such as wetlands, marshes and canals or the ground in marshes and canals. The maximum application rate is 10 lbs of bait (0.6% active ingredient (a.i.)) on anchored large rafts (4 feet by 4 feet), or on small waterways (irrigation ditches) 4 baits on anchored rafts that are at least 6 inches by 6 inches. Bait, placed on the ground, must be beside burrows or runways used by muskrats. However, only two to five pieces of bait can be placed on the ground at the location. No zinc phosphide- treated bait can be applied until untreated pre-bait is adequately accepted by the muskrats.

3.4 METHODOLOGIES CONSIDERED BUT DEEMED IMPRACTICAL, INEFFECTIVE, OR UNSAFE AT THE PRESENT TIME:

3.4.1 Harassment Activities - Harassment has generally proven ineffective in resolving beaver damage problems (Jackson and Decker 1993). Destroying beaver dams and lodges without removing resident beaver rarely resolves damage problems as beaver usually rebuild in the same vicinity in a very short time. Also, removal of food supplies to discourage beaver activity is generally not feasible nor ecologically desirable.

3.4.2 Repellents - No effective repellents are registered for beaver or muskrat damage management.

3.4.3 Reproduction control - A review of research evaluating chemically and/or surgically induced reproductive inhibition as a method for controlling nuisance beaver populations is contained in Novak (1987). Although these methods were effective in reducing beaver reproduction by up to 50%, the methods were not practical or were too expensive for large-scale application. Currently, no chemical reproductive inhibitors are registered nor legal for use for either of the species covered by this EA. For these reasons, this method will not receive further consideration.

3.5 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL WITH THE RATIONALE

Several alternatives were considered, but not analyzed in detail. These were:

3.5.1 Compensation for Wildlife Damage Losses

The compensation alternative would direct all Nebraska WS program efforts and resources toward the verification of losses from beaver and muskrats, and to provide monetary compensation for these losses. Nebraska WS activities would not include any direct damage management or technical assistance.

This option is not currently available to Nebraska WS because WS is charged by law to protect American agricultural and natural resources, property and public health and safety (Animal Damage Control Act of 1931, as amended; and the Rural Development, Agricultural and Related Agencies Appropriation Act of 1988). Analysis of this alternative by USDA (1994) shows that it has many drawbacks:

- Compensation would not be practical for public health and safety problems,
- It would require larger expenditures of money to investigate and validate all losses and to determine and administer appropriate compensation,

- Timely responses to all requests to assess and confirm losses would be difficult and many losses could not be verified,
- Compensation would give little incentive to limit losses through other management strategies,
- Not all resources managers/owners would rely completely on a compensation program and unregulated lethal control would probably continue and escalate,
- Neither Congress or the State of Nebraska has appropriated funds for a compensation program.

3.5.2 Eradication and Suppression

An eradication and suppression alternative would direct all Nebraska WS beaver and muskrat damage management efforts toward planned, total elimination or suppression of these species.

Eradication of beaver or muskrats in Nebraska is not supported by Nebraska WS or the NGPC. By Nebraska state statute, “...*it is the policy of this state to conserve species of wildlife for human enjoyment, for scientific purposes, and to ensure their perpetuation as viable components of their ecosystems.*” Revised Statutes of Nebraska (RSN §§37-432). Other statutory policies are to preserve the state’s natural resources and wildlife, and to protect wetlands (RSN §§37-401) (Defenders of Wildlife and the Center for Wildlife Law 1996). This alternative will not be considered by Nebraska WS in detail because:

- Nebraska WS opposes eradication of any native wildlife species,
- NGPC opposes eradication of any native Nebraska wildlife species,
- The eradication of a native species would be extremely difficult (if not impossible) to accomplish, and cost prohibitive, and
- Eradication is not acceptable to most members of the public.

Suppression would direct Nebraska WS program efforts toward managed reduction of certain problem wildlife populations or groups. To consider large-scale population suppression as a goal of the Nebraska WS program is not realistic, practical or allowable under present WS policy. Typically, WS activities in Nebraska are and would be conducted on a small portion of the area where beaver or muskrat damage occurs; currently, WS only conducts beaver or muskrat damage management on about 0.05% of the area of Nebraska.

In localized areas where damage can be attributed to specific groups, the NGPC has the authority to lengthen harvest seasons to increase hunter or trapper take (RSN §§37-301).

3.5.3 Bounties

Payment of funds (bounties) for killing beaver or muskrats suspected of causing economic losses is not supported by the NGPC (Morrison, B. NGPC, per. comm.) nor WS, and Nebraska WS does not have the authority to establish a bounty program. Bounties are not considered because:

- Bounties are generally not effective in reducing damage and have not been found effective in reducing populations,
- Circumstances surrounding take of animals is largely unregulated,
- Bounties may increase the take of non-target animals by inexperienced hunters,
- Sources of funding for bounties have not been identified and may be difficult to locate,
- No process exists to prohibit taking of animals from outside the damage management area for compensation purposes, and
- Nebraska WS does not have the authority to establish a bounty program.

3.5.4 Non-lethal Required Before Lethal Control

This alternative would not allow the use of lethal methods by WS as described under the proposed action until non-lethal methods had been implemented to relieve damage caused by beaver and muskrats and found to be ineffective or inadequate. Resource owners or managers would still have the option of utilizing non-lethal and lethal control measures. WS would always recommend non-lethal control methods before lethal methods. No preventive lethal control would be done. However, personnel experienced in beaver and muskrat damage management generally know when and where non-lethal control techniques would work; this alternative would result in the use of methods that are known to be ineffective in particular situations with damage and monetary losses occurring because of WS recommendations.

3.5.5 Beaver Damage Should be Managed by Hunters and Trappers

The jurisdiction for managing most resident wildlife rests with the NGPC who has the ability to request Nebraska WS assistance in achieving management objectives. WS damage management involves removing beaver or muskrat only at those sites where damage has occurred, such as a flooding or burrowing situation, or where damage is occurring or likely to occur. Typically damage management involves removing a small number of beaver or muskrats from a local area or drainage. WS is not involved in statewide or large-scale beaver or muskrat population reductions. Targeted populations include those found near designated highways or roads, and beaver and muskrats causing damage at site-specific areas, such as bridges, critical wildlife habitat, managed forests and ornamental trees and shrubs. Private contractors are also allowed to conduct beaver or muskrat removal under the provisions of NGPC (RSN §§37-304-02). Currently NGPC manages beaver and muskrats as a furbearer (RSN §§37-101(16)). If deemed necessary, the NGPC has the option to reduce restrictions on trapping and snaring to provide for more harvest and opportunities for sportsmen and women. It is the policy of the WS program to provide professional damage management upon request at site-specific locations by reducing the damage or threat of damage, and in the case of beaver, dam removal. Most private trappers and hunters are not able to provide year-round site-specific beaver or muskrat damage management. That option, however, remains open to entities experiencing damage or the threat of damage.

3.6 MITIGATION AND STANDARD OPERATING PROCEDURES FOR AQUATIC RODENT DAMAGE MANAGEMENT

Mitigation measures are any feature of an action that serves to prevent, reduce or compensate for impacts that otherwise might result from that action. The current WS program, nationwide and in Nebraska, uses many such mitigation measures and these are discussed in detail in Chapter 5 of USDA (1994). The following mitigating measures are incorporated into WS SOPs and Alternatives 1, 3 and 4:

- Alternative 1 - Current Program
- Alternative 2 - No Program
- Alternative 3 - Technical Assistance Only
- Alternative 4 - Non-lethal Only

Table 3-1. Mitigation Measures.

MITIGATION MEASURES	ALTERNATIVES			
	1	2	3	4
<i>Animal Welfare and Humaneness of Methods Used by WS</i>				
Research on selectivity and humaneness of management practices would be monitored and adopted as appropriate.	X		X	X
The Decision Model (Slate et al. 1992) is used to identify effective biologically and ecologically sound rodent damage management strategies and their impacts.	X		X	
Captured non-target animals are released unless it is determined by the Nebraska WS personnel that the animal would not survive.	X			X
The use of traps and snares conform to current laws and regulations administered by NGPC and Nebraska WS policy.	X		X	X
Euthanasia procedures approved by the AVMA are used.	X			
Drugs are used according to the Drug Enforcement Agency, FDA and WS program policies and directives, and procedures are followed that minimize pain.	X			X
The use of newly-developed, proven, non-lethal methods would be encouraged when appropriate.	X		X	X
<i>Safety Concerns Regarding WS Beaver and Muskrat Damage Management Methods</i>				
All pesticides are registered with the EPA and NDA.	X		X	
EPA-approved label directions would be followed by WS employees.	X		X	
Beaver and Muskrat damage management conducted on public lands would be coordinated with the land management agency.	X		X	X
WS employees that use pesticides are trained to use each material and are certified to use pesticides under EPA approved certification programs.	X		X	
WS employees, who use pesticides, participate in NDA approved continuing education to keep abreast of developments and maintain their certifications.	X		X	
Live traps would be placed so that captured animals would not be readily visible from any road or public area.	X		X	X
Pesticides use, storage, and disposal would conform to label instructions, other applicable laws and regulations, and Executive Orders.	X		X	
Material Safety Data Sheets for pesticides would be provided to all WS personnel involved with specific muskrat damage management activities.	X		X	

MITIGATION MEASURES	ALTERNATIVES			
	1	2	3	4
<i>Concerns about Impacts of Beaver and Muskrat Damage Management on T&E Species, Species of Special Concern, and Non-target Species.</i>				
WS consulted with the USFWS regarding the nation-wide program and would continue to implement all applicable measures identified by the USFWS to ensure protection of T&E species.	X		X	X
WS consulted with the USFWS and NGPC regarding the state-wide program and would continue to implement all applicable measures identified by the USFWS and NGPC to ensure protection of T&E species.	X		X	X
Nebraska WS take would be considered with the statewide “ <i>Total Harvest</i> ” (Nebraska WS take and fur harvest) when estimating the impact on wildlife species.	X		X	
Management actions would be directed toward localized populations or groups and/or individual offending animals, dependent on the magnitude of the problem.	X		X	X
WS personnel would be trained and experienced to select the most appropriate method for taking targeted animals and excluding non-target species.	X		X	X
WS would initiate informal consultation with the USFWS following any incidental take of T&E Species.	X		X	X

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

4.0 INTRODUCTION

Chapter 4 provides information for making informed decisions on the beaver and muskrat damage management outlined in Chapter 1 and the issues and affected environment discussed in Chapter 2. This chapter: 1) analyzes each alternative against the issues considered in detail, 2) assesses the consistency of the alternatives with existing management plans, and 3) analyzes of the environmental consequences of each alternative.

4.1 ALTERNATIVE CONSISTENCY WITH FOREST SERVICE LAND MANAGEMENT PLANS AND [REDACTED]

Before an Alternative can be considered for implementation on Forest Service or [REDACTED] lands, it must be consistent with land management and/or resource management plans. In the Forest Service, these are termed LMPs or more commonly "*Forest Plans*." On [REDACTED] lands, the equivalent documents are called [REDACTED] or in some older documents, [REDACTED]. If the selected Alternative is consistent with LMPs, [REDACTED] or [REDACTED], no further action would be necessary.

If an alternative that is inconsistent with LMPs, [REDACTED] or [REDACTED] is selected in the decision process, the Forest Service or [REDACTED] could amend their plans to be consistent with the EA. The Decision would not be implemented on Forest Service or [REDACTED] lands until the inconsistency was resolved either through amendment of the plans or modification of the selected alternative(s).

The following is a review of the consistency of each LRMP And [REDACTED]:

4.1.1 Nebraska National Forest LRMP

The Forest Service is responsible for: 1) managing land to maintain viable populations of existing native and desirable non-native vertebrate species, 2) to promote the conservation of federally listed T&E species, and 3) to coordinate and cooperate with appropriate federal, state, and private agencies to assure all management aspects of wildlife species are considered. The Forest Service requires Endangered Species Act Section 7 Consultation with the USFWS and NGPC which have been completed by WS for Nebraska (USDI 1992, J. Cochnar, USFWS letter to J. Hobbs, WS December 27, 1999; B. Morrison, NGPC letter to J. Hobbs, WS March 2, 2000). Aquatic rodent damage management within Nebraska will be provided by the Nebraska WS program. The proposed action is consistent with the direction in the Nebraska National Forest LRMP.

4.1.2 [REDACTED]

[REDACTED] lands in Nebraska total about [REDACTED] acres with [REDACTED] acres as the largest parcel and most areas at [REDACTED] acres. Beaver and muskrat damage management is addressed in the Nebraska [REDACTED] ([REDACTED] 2000). The [REDACTED] requires Endangered Species Act Section 7 Consultation with the USFWS and NGPC which have been completed by WS for Nebraska (USDI 1992, J. Cochnar, USFWS letter to J. Hobbs, WS December 27, 1999; B. Morrison, NGPC letter to J. Hobbs, WS March 2, 2000). The proposed action conforms with the intent of the [REDACTED]. Therefore, the proposed alternative is consistent with the [REDACTED].

4.2 ENVIRONMENTAL CONSEQUENCES

This section analyzes the environmental consequences using Alternative 1 (the Current Program) as the baseline for comparing the other alternatives to determine if the real or potential impacts are greater, lesser or the same (Table 4-4).

The following resource values within Nebraska would not be significantly impacted by any of the alternatives analyzed; soils, geology, minerals, visual resources, air quality, prime and unique farmlands, timber, and range. These resources will not be analyzed further.

4.2.1 Social and Recreational Concerns are discussed throughout the document as they relate to issues raised during public involvement and they are discussed in USDA (1994).

4.2.2 Cumulative and Unavoidable Impacts are discussed in relationship to each of the key wildlife species and the environmental impacts are analyzed in this chapter. This EA recognizes that the total annual removal of individual animals from wildlife populations by all causes is the cumulative mortality. Analysis of the Nebraska WS “takes” during 1997, 1998 and 1999, in combination with other mortality, indicates that cumulative impacts are not significant. Therefore, we do not anticipate that the Nebraska WS program would have any adverse cumulative impacts on T&E species (USDI 1992, J. Cochnar, USFWS letter to J. Hobbs, WS December 27, 1999) and beaver and muskrat damage management will not jeopardize public health and safety.

4.2.3 Irreversible and Irretrievable Commitments of Resources: Other than minor uses of fuels for motor vehicles and electrical energy for office maintenance, there are no irreversible or irretrievable commitments of resources. Based on these estimates, the Nebraska WS program produces very negligible impacts on the supply of fossil fuels and electrical energy.

4.2.4 Target and Nontarget Wildlife Species: Cumulative impacts to wildlife species are addressed in section 4.3.1.

4.3 ISSUES ANALYZED IN DETAIL

4.3.1 Concerns for the Nebraska WS Take of Beaver and Muskrat to Cause Population Declines When Added to Other Mortality.

When estimating wildlife populations, professional judgement is often required to account for unknowns and variables such as the ability of habitats to support populations and recruitment. The NGPC believes that wildlife populations in Nebraska can change considerably from one year to the next due to factors such as weather, diseases, etc. As a result, any population estimate would be for a given point in time and population levels could change rapidly if conditions change (B. Morrison, NGPC, pers. comm. 2000). The NGPC also believes that habitat and water conditions influence beaver and muskrat population densities to a greater extent than sport harvest or WS program takes (B. Morrison, NGPC, pers. comm. 2000). This EA is based on population indices and impact assessments derived from NGPC data (R. Bishop and F. Andelt, NGPC, unpubl. data) to ensure that no adverse beaver or muskrat population impacts occur.

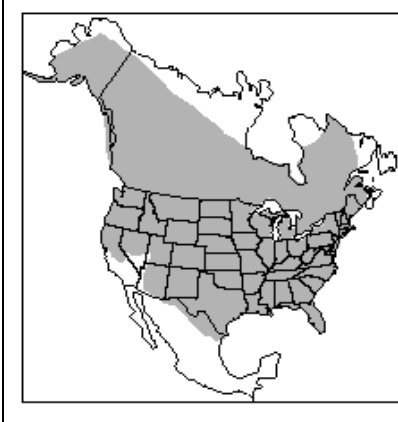
4.3.1.1 Alternative 1. - Continue the Current Nebraska WS Program: (Proposed, No Action).

In FY 1997, 1998 and 1999, beaver and muskrats were responsible for about \$155,540, \$188,250 and \$328,600, and \$250, \$2,010 and \$2,200 in verified and reported losses, respectively (MIS 1997, 1998, 1999).

Beaver Population Information

The beaver is the sole representative of the family *Castoridae* in North America and occupies a wide range of habitats (Figure 4-1). Water is the most important feature in the daily lives of beavers. Ideal beaver habitats are ponds, small lakes with muddy bottoms, and meandering streams although they occupy artificial ponds, reservoirs and drainage ditches if food is available. The current distribution of beaver is determined by food and water availability. Home range is greatly affected by the water system where beaver live. Small ponds and potholes may contain only one family; home ranges on streams have been reported to be about 0.5 mi of stream (Busher et al. 1983, Bergerud and Miller 1977). The beaver's existence depends on permanent water and a supply of woody vegetation. (Jones et al. 1983) If food is present, parts of Nebraska provide excellent beaver habitat except during periods of drought when beaver populations decline as water tables drop and wetlands dry up.

Figure 4-1. Distribution of Beaver



Beaver occur mostly in family groups that consist of two adult parents, offspring from the current breeding season and yearlings from the previous breeding season, totaling 2-6 individuals (Novak 1987). In central North America, beaver generally mate during January to March, with a gestation period from 105 to 107 days. Male and female beaver do not reach sexual maturity until about 21 months (Woodward 1977). Each family's breeding female produces one litter per year (Novak 1977, Wigley et al. 1983). Average litter size in North America is three or four offspring, however litter size can vary because of such factors as food availability (Longley and Moyle 1963, Huey 1956, Gunson 1970), elevation (Rutherford 1964, Harper 1968), weight of female (Wigley et al. 1983, Gunson 1970) and age (Henry and Bookhout 1969, Gunson, 1970, Payne 1984a). Gunson (1970) and Payne (1984a) concluded that beaver fecundity was also density-dependent.

The total number of beaver in an area depends on the number of families (colonies) found there and the average number of individuals per family. Beaver abundance has been reported in terms of families per kilometer of stream or per square kilometer of habitat. Novak (1987) summarized reported beaver family abundance as ranging from 0.3 to 1.5 families per kilometer of stream, or 0.5 - 2.4 families per mile of stream. Densities

reported in terms of families per square kilometer have been reported to range from 0.2 to 3.9, or 0.2 to 6.3 per square mile (Novak 1987).

Few studies have been conducted on adult beaver mortality factors, but the mortality factors that have been identified are trapping (Henry and Bookhout 1969, Novak 1977, Boyce 1981, Payne 1984b), severe winter weather (Lyons 1979), under ice starvation and malnutrition (Aleksiuk 1968, Bergerud and Miller 1977, Payne 1984b), water fluctuations and floods (Kennelly and Lyons 1983), and falling trees (Ellarson and Hickey 1952, Hitchcock 1954). Seven to eighteen percent of the beaver found by Payne (1984b) had shotgun wounds. Estimates of trapping mortality on various beaver populations were 25-70% (Hendry 1966), 13-19% (Henry and Bookhout 1969), 43% (Novak 1977), 20% (Boyce 1981) and 13-25% (Payne 1984b). The effect of predators on beaver populations is variable and dependent on the species of predator and alternate prey bases.

Beaver Population Impact Analysis

The NGPC estimated the beaver population at about 275,000 (R. Bischof, NGPC letter to J. Hobbs, WS. Sept. 11, 2000) and this estimate will be used to examine statewide cumulative impacts on beaver populations (Table 4-1). Nebraska WS removed 122, 182 and 172 beaver in FY 1997, 1998 and 1999, respectively (MIS 1997, 1998, 1999). Yeager and Rutherford (1957) determined various harvest rates depending on habitat conditions and management objectives. Annual harvest quotas in Ontario, after many years of study, are set at 30% of the population regardless of habitat type (Novak 1977). USDA (1994) determined that 30% of the beaver population could be removed and a stable population of beaver be maintained if water conditions remained favorable.

Table 4-1. Beaver Population and Harvest Data for Nebraska (MIS 1997, 1998, 1999 and NGPC, unpubl. data).

Beaver Population Statistics	1997	1998	1999
Estimated Beaver Population (NGPC)	275,000	275,000	275,000
WS Kill	122	182	172
* WS Kill - %	0.04%	0.07%	0.06%
Estimated Other Take (NGPC) Calendar Years	25,267	20,359	15,556
* Estimated Other Take (NGPC) Calendar Years - %	9.2%	7.4%	5.6%
Total cumulative take as a % of the estimated beaver population	9.24%	7.47%	5.66%

* % of the total estimated beaver population in NE.

The average annual take of beaver by Nebraska WS between 1997 and 1999 was 159 beaver or 0.05% of the estimated population. The FY 1998 Nebraska WS Program beaver take was the highest ever removed in one year at about 0.07% of the estimated population. The annual average "Other Take" of beaver between 1997 and 1999 was about 20,394 or 7.4% of the total estimated population. "Total Take" in 1997 was 25,267 beaver or 9.2% of the estimated statewide population, 20,359 beaver or 7.4% of the estimated statewide population in 1998 and 15,556 beaver or 5.6% of the estimated statewide population in 1999.

Based on this information and NGPC beaver population data, WS impact on the Nebraska beaver population, even with possible "Other Take" under-reporting, would not adversely affect the beaver population in Nebraska (Morrison, B. NGPC, pers. comm. 2000). In addition, WS had agreements to work on only about 0.5% of the total area of Nebraska. Thus, cumulative impact to the Nebraska beaver population appears to be well below the 30% level that would cause a decline in the overall statewide population. The cumulative impact on the Nebraska beaver population is therefore of low magnitude.

Muskrat Population Information

Muskrat damage reported to WS in Nebraska has been primarily from burrowing into dikes. During FY 1997, 1998 and 1999, muskrats were responsible for \$4,460 of the Nebraska WS verified damage (MIS 1997, 1998, and 1999).

The muskrat is distributed throughout North America and is one of the most heavily harvested furbearers (Boutin and Birkenholz 1987) (Figure 4-2). They live in diverse habitats; they can be found in freshwater

and brackish marshes, ponds, sloughs, lakes, ditches, streams, and rivers (Boutin and Birkenholz 1987), but must have a source of permanent water and a protected site for the shelter and rearing of young. Muskrats are considered the most prolific of the exploited North American furbearers (Smith et al. 1981). Breeding generally occurs when ponds and streams become ice-free (Olsen 1959). The gestation period is 28 to 30 days, and females can remate immediately after giving birth (Wilson 1955). Thus muskrats have the potential to produce a litter every month, but the number of litters per female in any breeding season is generally about 3-4 (Wade and Ramsey 1986). Average litter size varies from three to nine; litter size tends to be larger in more northern populations (Danell 1978). These characteristics help make muskrats relatively immune to over-harvest (Boutin and Birkenholz 1987).

Figure 4-2. Distribution of Muskrats



Sustainable harvest rates of from three to eight muskrats per acre have been reported (Boutin and Birkenholz 1987). Clearly, any mortality because of fur harvest (Table 4-2) or damage reduction would have virtually imperceptible impact on the population.

Errington (1963) stressed the density-dependent nature of muskrat population dynamics, but observed two external factors that regulated pronounced changes in muskrat numbers. These are drought and disease. O'Neil (1949) proposed that muskrats were regulated by food supply. Most movements by muskrats are restricted to their home range and home range size is probably dependent on habitat quality and population density.

Muskrat Population Impact Analysis

Using the 1997, 1998 and 1999 estimated "Take" by fur trappers as the basis of non-WS take, the "Total Take" of muskrats in 1997 was 57,010 in 1998 was 40,351 and in 1999 was 23,941. (Table 4-2) (F. Andelt, NGPC, unpubl. data). Nebraska WS killed one muskrat in 1997, seven muskrats in 1998, and nine muskrats in 1999 (MIS 1997, 1998, 1999). In FY 1999, WS had agreements to control muskrat damage on only 47 acres in Nebraska.

Table 4-2. Muskrat Population and Harvest for Nebraska (MIS 1996, 1997, 1998, NGPC, unpubl. data).

Muskrat Population Statistics	1997	1998	1999
Estimated Population	N/A	N/A	N/A
WS Kill	1	7	9
Estimated Other Take (Calendar Years 1997-99)	57,010	40,351	23,941

Smith et al. (1981), using a model, determined that muskrats could sustain an annual harvest of 74% of the fall population. The Nebraska WS data for 1997, 1998 and 1999 indicate that WS kills a small percentage of the muskrat population. The impact is determined to be low.

4.3.1.2 Alternative 2 - No Federal Nebraska WS Program and Alternative 3 - Technical Assistance Only.

Both Alternative 2 and Alternative 3 would result in no Nebraska WS operational program and no impacts to the beaver or muskrat populations would occur because of WS actions. Some type of beaver and muskrat damage management would most likely be conducted by other entities, possibly by various state or local governmental agencies or private individuals. The impacts on beaver and muskrat populations would differ considerably from those described in Alternative 1 because of the potential for improper or inappropriate selection and use of wildlife damage management methods, emphasis on lethal methods, duplication of effort, and possible misuse of chemicals (Schueler 1993).

A thorough review of the potential impacts of these two alternatives can be found in USDA (1994) which summarizes the biological impacts of the No WS Program alternative as follows:

"Biological impacts that would be expected under the No Action Alternative (No ADC Program Alternative in this EA) include all impacts that occur under the Current Program Alternative (No Action Alternative in this EA) plus impacts that relate to the reasons listed previously. Taking of target species would be more variable (i.e., lower for some species in some areas and higher in other areas). However, taking of nontarget species probably would be higher, and for some small populations, could become biologically significant. This would be especially important if the species was threatened or endangered. Species diversity could be significantly affected. The indirect impacts on nontarget species affected through the food chain or by uncontrolled releases of toxicants into the environment also could increase. In some areas, people could use unapproved chemical methods. Misuse of chemicals could increase and thereby adversely affect certain wildlife populations and public health and safety."

We can only speculate on how beaver or muskrat damage management would be handled without WS involvement, although several obvious effects can be identified. State or county agencies or private entities would not be subject to the restrictions and operating policies imposed on Nebraska WS (such as NEPA, WS Directives), and coordination and planning with other federal and state agencies. Any state agency assumption of beaver and muskrat damage management would probably dilute resources needed for other wildlife management and state functions. Alternative 2 and 4 would likely have greater adverse impacts on wildlife populations than the current program.

4.3.1.3 Alternative 4: Non-lethal Only.

Under this alternative, WS take of target beaver and muskrats would probably be less than that of the proposed action because no lethal actions by WS would occur. However, in most cases the requestor has already tried non-lethal damage management methods without success prior to contacting WS. In many damage situations, requesters have tried one or more non-lethal methods (such as dam removal or barriers) without success or have considered and found them to be impractical in their particular situations.

Under Alternative 4, no preventive lethal damage management actions would be taken by WS. With implementation of only non-lethal methods, damage could be expected to rise significantly. Therefore, it is likely that private efforts at control would increase, leading to potentially similar cumulative impacts as those described for Alternative 2. It is also highly unlikely that statewide beaver or muskrat populations would be impacted significantly by implementation of this alternative (see population impacts analysis 4.3.1.1). Impacts and hypothetical risks of illegal toxicant use under this alternative would probably be similar to those described in relation to Alternatives 2 and 3, but to a lesser degree.

4.3.2 Concerns about the Selectivity and Effectiveness of Beaver and Muskrat Damage

Management Methods.

Chapter 3 includes discussion about the relative effectiveness and selectivity of the various methods used by Nebraska WS and that discussion will not be repeated here. Under the current program, all methods are used as selectively and effectively as possible, in conformance with the WS Decision Model (Slate et al. 1992) and WS Program Directives. The selectivity of each method is based, in part, on the application of the method and the skill of Nebraska WS personnel, and the direction provided by WS Directives and policies. Nebraska WS personnel are trained in the use of each method and are certified as pesticide applicators by the NDA. Effectiveness of the various methods may vary depending on local circumstances at the time of application. Some methods may be more or less effective or applicable depending on weather conditions, time of year, biological considerations, economic considerations, legal and administrative restrictions, or other factors. Because these various factors may at times preclude use of certain methods, maintaining the widest possible selection of wildlife damage management tools to most effectively resolve beaver or muskrat damage management problems is important.

4.3.2.1 Alternative 1. - Continue the Current Nebraska WS Program: (Proposed, No Action).

Several methods employed under the current program are typically highly selective for target species. These methods include live traps and shooting. While the methods discussed above are typically very selective in taking target species, other methods such as leg-hold traps, conibear traps and snares are less selective (Table 4-3). However, non-target species can be released from leg-hold traps, live traps and snares without significant injuries.

Nebraska WS use of pan-tension devices makes leg-hold traps more selective. Pan-tension devices are used by Nebraska WS personnel unless their use would preclude capture of the intended target species (WS Directive 2.450). Pan-tension devices increase the weight required to spring the trap and are used successfully to significantly reduce the incidence of capturing smaller non-target species (Turkowski et al. 1984, Phillips and Gruver 1996).

As used by Nebraska WS personnel, leg-hold traps are less selective for target species than snares, live or body grip traps. The selectivity of traps and snares largely depends on how and where they are set. Snares are less expensive than leg-hold traps, however, the longevity of traps may make traps more cost-effective than snares. Traps and snares are selective as used by Nebraska WS personnel because of their trapping skill, mitigation measures, and the WS trapping policy restrictions (WS Directive 2.450).

Table 4-3. Selectivity of Leghold, Hancock and Conibear Traps and Snares by the Nebraska WS Program, FY97-99

TAKE	Leg-hold Traps	Body Grip Traps	Live Beaver Traps	Snares
<u>Targets</u>				
Beaver	7	314	6	57
Muskrat	0	6	0	0
3-Year Total	7	320	6	57
<u>Non-targets</u>				
Raccoon	1	2	0	3
Turtle	0	22	0	0
Beaver	1	0	0	0
Muskrat	0	5	0	0
3-Year Total	2	29	0	3
% Selectivity	88	92	100	95

Most target animals captured are euthanized and captured non-target species are released if determined capable of surviving. Target to non-target capture rates for non-WS trappers that do not use pan-tension devices contribute to the perception that leg-hold traps are not selective. Traps are considered moderately

expensive due to initial cost, maintenance, trap-check requirements, increased travel time, and the need for a larger workforce to use traps effectively.

Shooting accounted for 98 (25%) target animals taken in Nebraska in 1997 through 1999 (MIS 1997, 1998, 1999). Shooting by Nebraska WS personnel is an extremely selective method; no known non-target animals were taken using this method in 1997 through 1999, (MIS 1997, 1998, 1999). Capture methods (i.e., leg-hold, Hancock, and conibear traps and snares) accounted for 390 (75%) target animal captures in 1997 through 1999 (MIS 1997, 1998, 1999).

4.3.2.2 Alternative 2 - No Federal Nebraska WS Program and Alternative 3 - Technical Assistance Only.

These two Alternatives provide for no cooperative Nebraska WS program, therefore, selectivity and effectiveness of methods used by Nebraska WS would not be an issue. Requester-implemented lethal methods may not be as selective due to their lack of training, experience, and time to devote to resolving beaver or muskrat problems.

4.3.2.3 Alternative 4 - Non-lethal Beaver and Muskrat Damage Management Only.

Under this alternative, WS take of nontarget animals would be less than that of the proposed action because no lethal damage management actions would be taken by WS. Mitigation measures to avoid T&E impacts were described in Chapter 3. Those measures should assure that adverse impacts are not likely to occur to T&E species by implementing Alternative 4. However, if cooperators were not satisfied by non-lethal operations by WS, private efforts to reduce or prevent depredations could increase, similar to Alternative 1. This could result in less experienced persons implementing control methods including the hypothetical use of illegal toxicants and could lead to a greater take of nontarget wildlife than under the proposed action.

4.3.3 Concerns about the Effects of Nebraska WS Beaver and Muskrat Damage Management on Public Health and Safety.

A common concern is whether the proposed action or any of the alternatives pose an increased threat to public and pet health and safety. In particular, there is concern that the lethal methods of beaver and muskrat removal (i.e., trapping and shooting) may be hazardous to people and pets, or that continued increases in beaver and muskrat populations might threaten public and pet health or safety.

4.3.3.1 Alternative 1- Continue the Current Nebraska WS Program: (Proposed, No Action).

Effects on public health and safety include potential benefits created by Nebraska WS fostering a safer environment and the potential negative effects that might result from the exposure of the public to wildlife damage management methods.

WS methods of shooting and trapping pose minimal or no threat to public and pet health and safety. All firearm safety precautions are followed by WS when conducting damage management and WS complies with all laws and regulations governing the lawful use of firearms. Shooting with shotguns or rifles is sometimes used to reduce beaver and muskrat damage when lethal methods are determined to be appropriate. Shooting is selective for target species and may be used in conjunction with spotlights. WS uses firearms to humanely euthanize beaver and muskrats caught in live traps. WS traps are strategically placed to minimize exposure to the public and pets. Appropriate signs are posted on all properties where traps are set to alert the public of their presence. Body grip (e.g., conibear-type) traps are restricted to water sets, which further reduces threats to public and pet health and safety.

Firearm use is very sensitive and a public concern because of safety issues relating to the public and misuse. To ensure safe use and awareness, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 3 years afterwards (WS Directive 2.615). WS employees who use firearms as a condition of employment, are required to sign a form certifying that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

One method that is used in muskrat damage management (zinc phosphide) could pose risks. No chemical methods are used for beaver damage management. Risks associated with zinc phosphide use are mitigated through specific direction provided by WS program policies. Risks identified in the evaluation process for this chemical were primarily environmental risks addressed by the EPA rather than safety or health risks to the public.

WS occasionally utilizes binary explosives to breach beaver dams. WS personnel that use explosives are required to take and pass in-depth training, are certified to use explosives and must be able to demonstrate competence and safety in their use of explosives. They adhere to WS policies as well as regulations from the Bureau of Alcohol, Tobacco and Firearms, the Occupational Safety and Health Administration, and the Department of Transportation with regards to explosives use, storage, and transportation. Binary explosives require two components to be mixed before they can be actuated which virtually eliminates the hazard of accidental detonation during storage and transportation. Storage and transportation of mixed binary explosives is not allowed. When explosives are used, signs are placed to stop public entry. Where dams are near roads, police or other road officials are used to stop traffic and public entry, much like Nebraska Department of Roads crews when they use explosives, to ensure public safety. Therefore, no adverse effects to public safety are expected from the use of explosives by WS.

Alternative 1 would reduce threats to public health and safety by removing beaver and muskrats from a site, and thus alleviating damage such as flooding and burrowing damage to roads and railroads, risks of Giardiasis outbreaks, and possible mosquito borne disease outbreaks. The risks to health or safety are generally limited to WS personnel associated with implementing the method. The potential benefits from the Nebraska WS Program include increased public health and safety on roadways, railroad beds, reduced disease threats to humans and domestic pets (e.g., giardia, tularemia), and protection of agricultural and natural resources.

4.3.3.2 Alternative 2 - No Federal Nebraska WS Program and Alternative 3 - Technical Assistance Only.

Alternatives 2 and 3 would result in no federal cooperative operational beaver or muskrat damage management program in Nebraska. The low risks associated with Nebraska WS use of beaver and muskrat damage management methods would be nonexistent under these alternatives (i.e., no program, no risks from the WS program). However, increased use of the same methods and the potential use of non-registered toxicants by private individuals may pose an increased risk to the public. No program would be available for the protection of public health and safety and the NGPC and HHS would not have access to Nebraska WS personnel if there is a zoonosis outbreak. Both alternatives would result in increased risks to public health or safety over those identified in Alternative 1.

4.3.3.3 Alternative 4 - Non-lethal Beaver and Muskrat Damage Management Only.

Alternative 4 might cause local governments and individuals to discontinue their cooperation with federally supervised WS program and result in activities similar to those described under Alternative 1. However, this would be less likely than under Alternatives 2 or 3 because some beaver and muskrat

damage management needs would be met by WS. Risk of adverse impacts to the public from the use of beaver and muskrat damage management methods would be greater than the current program.

4.4 SUMMARY OF NEBRASKA WILDLIFE SERVICES IMPACTS

A comparison of the alternatives and environmental consequences (impacts) is provided in Table 4-4. The level of impacts is based on the above analysis and rated as: Low, Low/Neutral, Moderate, Moderate/High, or High.

Based on the diversity and distribution of the affected environment, the analysis in this EA failed to identify any cumulative impacts nor are any significant impacts to the human environment expected because of beaver or muskrat damage management conducted by the Nebraska WS program. Any localized reduction of beaver or muskrat populations would soon be restored and habitats re-occupied as Nebraska WS personnel could only conduct damage management on areas with Agreements for Control, Cooperative Agreements or other comparable documents. The impacts (“*Other Take + Nebraska WS Take*”) to target and non-target populations from Nebraska WS are low and do not have long-term adverse effects on any species.

Table 4-4. Issues/Impacts/Alternatives Comparison

Issues/Impacts	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Beaver	Low	Low	Low	Low
Muskrat	Low	Low	Low	Low
Non-target	Low	Moderate (-)	Low	Moderate (-)
T&E Species	Low	Mod/High (-)	Low	Moderate (-)
Methods*	Low	Moderate (-)	Low	Moderate (-)
Selectivity	Low	Moderate (-)	Low	Moderate (-)
Public Health and Safety	Moderate (+)	Moderate (-)	Low	Moderate (-)

* Evaluated on the use of damage management methods and not on perceptions because of a wide range of human perceptions on the issue.

CHAPTER 5: LIST OF PREPARERS, REVIEWERS AND CONSULTANTS

Jeff Abegglen	Wildlife Biologist, U.S. Department of Agriculture, U. S. Forest Service, Nebraska National Forest, Pine Ridge Ranger District, Chadron, Nebraska; Reviewer
Frank Andelt	Wildlife Biologist/Small Mammal Program Manager, Nebraska Game and Parks Commission, Research Section, Lincoln, Nebraska; Consultant/Reviewer
Richard Bischof	Wildlife Biologist/Wildlife Program Manager, Wildlife Division, Nebraska Game and Parks Commission, Lincoln, Nebraska; Consultant/Reviewer
Butch Ellis	Resource Coordinator, U.S. Department of Agriculture, U. S. Forest Service, Nebraska National Forest, Supervisor's Office, Chadron, Nebraska; Reviewer
Ronald Fryda	District Supervisor, U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, Nelson, Nebraska; Writer/Editor
Candace Gorton	Chief of Environment and Economics Section, U.S. Army Corp of Engineers, Omaha, Nebraska; Reviewer
Dick Gray	Agronomist, Nebraska Department of Roads, Roadside Development Section,
Robert Harms	Wildlife Biologist/Environmental Analyst, Wildlife Division, Nebraska Game and Parks Commission, Lincoln, Nebraska; Consultant/Reviewer
David Hayes	Wildlife Biologist/Environmental Coordinator, U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, Billings, Montana; Primary Writer/Editor
John Hobbs	Wildlife Biologist/Assistant State Director, U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, Lincoln, Nebraska; Primary Writer/Editor

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Appendix B

AUTHORITY AND COMPLIANCE

Authority of Federal³ and State Agencies in Wildlife Damage Management in Nebraska

Wildlife Services

The primary statutory authority for the WS program is the Animal Damage Control Act of 1931, as amended, which provides that:

"The Secretary of Agriculture is authorized and directed to conduct such investigations, experiments, and tests as he may deem necessary in order to determine, demonstrate, and promulgate the best methods of eradication, suppression, or bringing under control on national forests and other areas of the public domain as well as on State, Territory or privately owned lands of mountain lions, wolves, coyotes, bobcats, prairie dogs, gophers, ground squirrels, jackrabbits, brown tree snakes and other animals injurious to agriculture, horticulture, forestry, animal husbandry, wild game animals, furbearing animals, and birds, and for the protection of stock and other domestic animals through the suppression of rabies and tularemia in predatory or other wild animals; and to conduct campaigns for the destruction or control of such animals. Provided that in carrying out the provisions of this Section, the Secretary of Agriculture may cooperate with States, individuals, and public and private agencies, organizations, and institutions."

Since 1931, with changes in societal values, WS' policies and programs have placed greater emphasis on the part of the Act discussing "*bringing (damage) under control*," rather than "*eradication*" and "*suppression*" of wildlife

³Detailed discussions of WS' legal responsibilities and key legislation pertinent to wildlife damage are found in Chapter 1 of USDA (1994).

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populations. In 1988, Congress strengthened the legislative directive of WS with the Rural Development, Agriculture, and Related Agencies Appropriations Act. This Act states, in part:

"That hereafter, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with States, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammal and bird species that are reservoirs for zoonotic diseases, and to deposit any money collected under any such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control activities."

Nebraska Game and Parks Commission and Nebraska Department of Agriculture

The NGPC is responsible for managing all protected and classified wildlife in Nebraska, including federally listed T&E species, despite the land class the animals inhabit (RSN §§37-101, §§37-204, §§37-209, §§37-211, §§37-213, §§37-215, §§37-301, §§37-432, §§37-432.01, §§37-434).

Beaver and muskrat are protected in Nebraska and are classified as furbearers under (RSN 37-101), administered by the NGPC. The [REDACTED], NGPC, UNCE and HHS currently have an MOU Nebraska WS that establishes a working relationship and outlines responsibilities, and sets forth objectives and goals for WS to resolve wildlife damage management conflicts in Nebraska. The [REDACTED] is authorized to enter into Agreements with Nebraska WS and local entities to reduce or minimize wildlife damage.

NGPC and WS have an MOU and Work Plan that authorizes WS to "evaluate animal damage control methods and procedures to limit potential adverse effects" and "to minimize the detrimental impacts of wild animal species". In this MOU, WS is to "direct and supervise animal damage control programs and employees to assure application of the most effective, acceptable controls available".

NGPC statute requires persons having problems with beaver or muskrat obtain a special permit for their control when the control is needed at a time other than during the annual fur season (RSN §§37-304.02). WS personnel will assist with beaver control upon request of the individual holding the permit (Supplement #1 NGPC Work Plan to MOU 12-34-73-194).

The [REDACTED] currently has a MOU, agreements, and work plan with the Nebraska WS. These documents establish a relationship between the Nebraska WS, NGPC, [REDACTED], UNCE and the HHS, and outline responsibilities and set forth objectives and goals for each agency for resolving wildlife damage management conflicts in Nebraska and program responsibility (Supplement #2 [REDACTED] Work Plan to MOU 12-34-73-194).

The [REDACTED] is authorized to make funds available for equipment, supplies, and other expenses, including expenditures for personal services by WS, as may be necessary to execute the functions imposed upon [REDACTED] as provided by the general appropriation bill (Legislative Bill 392).

Nebraska Counties

County boards may enter into agreements for the purpose of carrying on an organized wildlife damage management program within their respective counties. *"The county boards may cooperate with the Animal and Plant Health Inspection Service of the United States Department of Agriculture and state agencies . . . in the control of coyotes, bobcats, foxes, badgers, opossums, raccoons, skunks, and other predatory animals in this State*

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that are injurious to livestock, poultry, and game animals and the public health. The county boards may also undertake the control of . . . other nuisance wildlife if such . . . wildlife are causing or about to cause property damage or represent a human health threat. All control efforts shall be in accordance with the organized and systematic plans of the United States Department of Agriculture and state agencies covering the management and control of animals, birds, and wildlife” (RSN §§23-358).

“In order to support the cost of managing and controlling the animals, birds, or wildlife listed in section 23-358, each county shall match funds supplied by any resident individual or group of individuals either living within the county or owning property therein, up to a maximum of one thousand dollars annually for any specific animal damage control program, and may furnish such additional money as the county board shall deem necessary for the funding of such programs. The county board of each county is authorized to make necessary expenditures from the general fund of the county, except the portion supplied by each county shall not exceed fifty percent of the total animal damage control program cost, unless such county elects to bear the entire program cost under sections 23-358 to 23-361. A county desiring to cooperate with another county or counties for the establishment of animal damage control services as set forth in sections 23-358 to 23-361 may enter into agreements and match funds for the establishment of an area program with the state or federal government” (RSN §§23-358.01). County boards are authorized to make necessary expenditures from any funds of the county to perform animal damage control (RSN §§23-359). “The county board of each county in this state may levy upon every dollar of taxable value of all the taxable property in such county, for the use of the county board in carrying out the animal damage control program . . . The entire fund derived from such levy shall be set apart in a separate fund and expended only for animal damage control as defined by sections 23-358 to 23-360” (RSN §§23-260). Nebraska counties may also tax cattle and sheep, not to exceed twenty cents per head, to provide funding for animal damage control programs for the management and control of coyotes, bobcats, foxes, and other predatory animals destructive of cattle and sheep (RSN §§23-361).

U.S. Fish and Wildlife Service

The USFWS has the statutory authority to manage federally listed T&E species through the ESA of 1973 (16 U.S.C. 1531-1543, 87 Stat. 884) with most resident wildlife species managed by the NGPC.

U.S. Forest Service and [REDACTED]

The Forest Service and [REDACTED] have the responsibility to manage federal lands for multiple uses including livestock grazing, timber production, recreation and wildlife habitat, while recognizing the State's authority to manage wildlife populations. Both the Forest Service and [REDACTED] recognize the importance of managing wildlife damage on lands and resources under their jurisdiction, as integrated with their multiple use responsibilities. For these reasons, both agencies have entered into MOUs with WS to facilitate a cooperative relationship.

University of Nebraska Cooperative Extension

The UNCE, through its Educators, Specialists and Assistants provides a wide range of information on the prevention and control of wildlife damage. The UNCE conducts educational programs pursuant to the Smith-Lever Act of 1914 (7 USC 341-349) and subsequent amendments.

Compliance with Federal Laws

Appendix B

AUTHORITY AND COMPLIANCE

Several federal laws regulate wildlife damage management. WS complies with these laws and consults and cooperates with other agencies as appropriate.

National Environmental Policy Act

This beaver and muskrat damage management EA, with WS as the lead agency, is the first time that all land classes under cooperative agreements, agreements for control and WS Work Plans for Nebraska will be analyzed in a comprehensive manner. Environmental documents pursuant to NEPA must be completed before actions, consistent with the NEPA supported decision, can be developed and implemented.

WS also coordinates specific projects and programs with other agencies. The purpose of these contacts is to coordinate any wildlife damage management that may affect resources managed by these agencies or affect other areas of mutual concern. Federal agency requests for WS' assistance to protect resources outside the species discussed in this EA would be reviewed, and if necessary, the agency requesting the assistance would be responsible for NEPA compliance.

Endangered Species Act

It is WS' and federal policy, under the ESA, that all federal agencies shall seek to conserve T&E species and shall utilize their authorities in furtherance of the purposes of the Act (Sec.2(c)). WS conducts consultations with the USFWS, as required by Section 7 of the ESA, to utilize the expertise of the USFWS to ensure that "*any action authorized, funded or carried out by such an agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species . . .*" (Sec.7(a)(2)). Nebraska WS completed a consultation with the USFWS and NGPC for those species listed in Nebraska and received concurrence that Alternatives 1 and 3 (No Action and Proposed Action, respectively) were unlikely to adversely affect T&E species.

Federal Insecticide, Fungicide, and Rodenticide Act

FIFRA requires the registration, classification and regulation of all pesticides used in the United States. The EPA is responsible for implementing and enforcing FIFRA. All pesticides used or recommended by the WS program in Nebraska are registered with, and regulated by, the EPA and the NDA. Nebraska WS uses all chemicals according to label directions as required by the EPA and NDA.

National Historical Preservation Act of 1966 as Amended

NHPA requires federal agencies to: 1) evaluate the effects of any federal undertaking on cultural resources, 2) consult with the State Historic Preservation Office regarding the value and management of specific cultural, archaeological and historic resources, and 3) consult with appropriate American Indian Tribes to determine whether they have concerns for traditional cultural resources in areas of federal undertakings.

Native American Graves Protection and Repatriation Act

The NAGPRA requires federal agencies to notify the proper authority (the Secretary of the Department that manages the federal lands) upon the discovery of Native American cultural items on federal or tribal lands. Federal projects will discontinue work until a reasonable effort has been made to protect the items and the proper notifications have been made.

NEBRASKA BEAVER AND MUSKRAT DAMAGE MANAGEMENT

DECISION AND FINDING OF NO SIGNIFICANT IMPACT

The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service-Wildlife Services (APHIS-WS) program responds to requests for assistance from individuals, organizations and agencies experiencing damage caused by wildlife. Ordinarily, according to APHIS procedures implementing the National Environmental Policy Act (NEPA), individual wildlife damage management actions could be categorically excluded (7 CFR 372.5(c), 60 Fed. Reg. 6000-6003, 1995). To evaluate and determine if any potentially significant impacts to the human environment from Nebraska WS' planned and proposed beaver and muskrat damage management program would occur, an environmental assessment (EA) was prepared. The EA documents the need for beaver and muskrat damage management in Nebraska and assesses potential impacts of various alternatives for responding to damage problems. The EA analyzes the potential environmental and social effects for resolving beaver and muskrat damage related to the protection of agricultural and natural resources, property, and threats to public health and safety on private and public lands in Nebraska. APHIS-WS' proposed action is to continue an Integrated Wildlife Damage Management (IWDMM) program to reduce beaver and muskrat damage on all land classes in Nebraska. Comments from public involvement letters were reviewed for substantial issues and

alternatives which were considered in developing this Decision.

APHIS-WS is the federal program authorized and directed by Congress to reduce damage caused by wildlife (Animal Damage Control Act of March 2, 1931, as amended (46 Stat. 1486; 7 U.S.C. 426-426c) and the Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988, Public Law 100-102, Dec. 27, 1987. Stat. 1329-1331 (7 U.S.C. 426(c)). Wildlife damage management is the alleviation of damage or other problems caused by or related to the presence of wildlife, and is recognized as an integral part of wildlife management (The Wildlife Society 1992). APHIS-WS uses an IWDM approach, commonly known as Integrated Pest Management (WS Directive 2.105) in which a combination of methods may be used or recommended to reduce damage. APHIS-WS wildlife damage management is not based on punishing offending animals but as one means of reducing damage and is used as part of the WS Decision Model (Slate et al. 1992, USDA 1997, WS Directive 2.201). The imminent threat of damage or loss of resources is often deemed sufficient for wildlife damage management actions to be initiated (U.S. District Court of Utah 1993). Resource owners and management agencies have requested APHIS-WS to conduct beaver and muskrat damage management to protect agricultural and natural resources, property, and wildlife in Nebraska. All Nebraska WS wildlife damage management is in compliance with relevant laws, regulations, policies, orders and procedures, including the Endangered Species Act (ESA) of 1973 and the Clean Water Act of 1977.

Nebraska has a total area of about 77,358 mi² (49,509,120 acres) (Nebraska Blue Book 1998-1999); in Fiscal Year (FY) 00, Nebraska WS had agreements to conduct beaver or muskrat damage management on about 113,252 acres or about 0.23% of the land area and averaged less than 0.5% of Nebraska during FY97 through FY99 (Management Information System (MIS) 1997, 1998, 1999, 2000). Nebraska contains lands under the administration of the U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service (Forest Service), Bureau of Land Management (BLM), Bureau of Reclamation (BOR), U.S. Army Corps of Engineers (USACE), American Indian Tribes, Nebraska Board of Education Lands and Funds (State trust), Nebraska Game and Parks Commission (NGPC), Nebraska Department of Natural Resources (DNR), Nebraska Department of Roads (NDOR), county, municipal and private lands.

APHIS-WS consults with the Forest Service, [REDACTED], USFWS, USACE, NGPC, [REDACTED], DNR, NDOR, Nebraska Association of County Officials, Nebraska Department of Health and Human Services (HHS) and the University of Nebraska Cooperative Extension (UNCE), as appropriate, to reduce wildlife damage. The NGPC has the responsibility to manage all wildlife in Nebraska, including Federally listed T&E species and migratory birds, which is a joint responsibility with the USFWS. Memoranda of Understanding (MOUs) signed between APHIS-WS and the Forest Service, [REDACTED], NGPC, and [REDACTED] clearly outline the responsibility, technical expertise and coordination between agencies. The MOUs with the Forest Service and [REDACTED] provide guidance for compliance with the NEPA and the basis for the interdisciplinary process used to develop the EA. A Multi-agency Team of personnel from APHIS-WS, Forest Service, [REDACTED], USFWS, USACE, NGPC, [REDACTED], NDOR, HHS, DNR, and UNCE were invited and convened to refine issues and assess the impacts of APHIS-WS' proposed action and prepare objectives and identify preliminary alternatives to beaver and muskrat damage management in Nebraska. The USACE, USFWS, Forest Service, [REDACTED], NGPC, DNR, and NDOR cooperated with Nebraska WS' to determine whether the proposed action is in compliance with relevant management plans, laws, regulations, policies, orders, and procedures.

Consistency

Wildlife damage management conducted in Nebraska will be consistent with MOUs and policies of APHIS-WS, the NGPC, [REDACTED], NDOR, HHS, USFWS, Forest Service, [REDACTED], USACE, and the EA. Wildlife damage management conducted on National Forest System and [REDACTED] lands in Nebraska will be consistent with MOUs and policies of APHIS-WS, the Land and Resources Management Plans for the National Forest System Lands, the [REDACTED] lands, and the EA. The agencies may, at times, restrict damage management that concerns public safety or resource values.

The analyses in the EA demonstrate that Alternative 1: 1) best addresses the issues identified in the EA, 2) provides safeguards for public health and safety, 3) provides WS the best opportunity to reduce damage with low impacts on non-target species, 4) balances the economic effects to agricultural and natural resources and property, and 5) allows APHIS-WS to meet its obligations to the NGPC and other federal, state, county or municipal agencies or private entities.

Monitoring

The Nebraska WS program will provide the NGPC the APHIS-WS take of target and non-target animals to help insure the total statewide take (WS take in addition to sport harvest) does not adversely affect the viability of beaver or muskrat populations as determined by the NGPC. WS will also review their beaver and muskrat damage management activities annually to insure compliance with the analysis in the EA. If it is determined that new needs for action or new alternatives need to be analyzed, WS will prepare a new EA or amend this EA to ensure NEPA compliance.

Public Involvement

Due to interest in the Nebraska WS Program, the Multi-agency Team concurred that Nebraska WS include an invitation for public comment in this EA process. An invitation for public comment letter containing preliminary issues, objectives, alternatives, and a summary of the need for action was sent to 166 individuals or organizations who had identified an interest in Nebraska WS' beaver and muskrat management program. Notice of the proposed action and invitation for public involvement were placed in five newspapers with circulation throughout Nebraska with an invitation for the public to participate in the EA process. Public comments were documented from eleven letters or written comments. The responses both supported and opposed (nine supported the program and two opposed the program) the proposal or parts of the proposal. These letters were reviewed to identify additional issues, alternatives, or to redirect the objectives of the program. The pre-decisional EA was sent to those that responded to the invitation for public involvement letter and notices were published in the same five newspapers with circulation throughout Nebraska inviting comments from the public on the pre-decisional EA. One letter was received from review of the pre-decisional EA. All responses are maintained in the administrative file at the Nebraska WS State Office, P.O. Box 81866, Lincoln, Nebraska 68501-1866.

Affected Environment

The areas of the proposed action include state and interstate highways and roads, county roads, and railroads and their right-of-ways where beaver and muskrat activities could cause damage. The areas could also include property in or adjacent to subdivisions, businesses and industrial parks where beaver impound water and gnaw or fell trees. Additionally, affected areas include timberlands, croplands, and pastures that experience financial losses from beaver flooding or gnawing. The proposed action could also include private and public property where muskrat or beaver burrowing and other activities cause damage to dikes, ditches, ponds, and levees and negatively impact the recovery of T&E species.

Major Issues

The EA describes the alternatives considered and evaluated using the identified issues. The following issues were identified as important to the scope of the analysis (40 CFR 1508.25).

1. Concerns for the Nebraska WS' kill of beaver and muskrat to cause population declines, when added to other mortality.
2. Concerns about the selectivity and effectiveness of beaver and muskrat damage management.
3. Concerns about the effects of Nebraska WS' beaver and muskrat damage management on public health and

safety.

Alternatives That Were Fully Evaluated

The following alternatives were developed by the Multi-agency Team to respond to the issues. Three additional alternatives were considered but not analyzed in detail. A detailed discussion of the effects of the alternatives on the issues is described in the EA; below is a summary of the alternatives and issues.

Alternative 1. No Action⁴ /Proposed Action: Continue the Current Nebraska WS Program. This alternative would continue beaver and muskrat damage management based on the needs of multiple resources (agricultural and natural resources, roadways and bridges, railroad beds, property, and public health and safety). The current program is a collection of cooperative programs with federal, state and local agencies, and private individuals and associations. Alternative 1 would allow WS to continue the current program of technical and operational assistance with beaver and muskrat damage on federal, state, tribal, county and private lands under MOUs, Cooperative Agreements, and Agreements for Control. Management is directed toward localized populations, groups, and/or individual animals, depending on the circumstances. Nebraska WS has MOUs with agencies such as the Forest Service, ■■■■■, ■■■■■, NGPC, HHS, and UNCE to provide direction for program activities. All damage management is based on interagency relationships, which require close coordination and consultation because of overlapping authorities. Damage management programs would be implemented following consultations with the NGPC, federal agencies, or tribes, as appropriate. Alternative 1 conforms to the MOUs between APHIS-WS, the National Forest System and ■■■■■ lands and analysis of alternative 1 indicated a low level of impact to target, non-target, and T&E species.

Alternative 2. No Federal Nebraska WS Program. This alternative would terminate the federal beaver and muskrat damage management program in Nebraska. Alternative 2 was not selected because WS is charged by law and reaffirmed by a recent court decision to reduce damage caused by wildlife (Animal Damage Control Act of 1931, as amended, ; and the Rural Development, Agriculture and Related Agencies Appropriations Act of 1988, U.S. District Court of Utah 1993). Therefore, this alternative would not allow WS to meet its statutory responsibility for providing assistance or to reduce wildlife damage. Alternative 2 is also not in accordance with the MOUs between APHIS-WS, the Forest Service and ■■■■■. Alternative 2 would not allow WS to: 1) respond to requests, 2) monitor the implementation of producer used non-lethal methods, 3) assist the NGPC or USFWS in meeting wildlife management objectives, 4) address public health and safety requests, and 5) it would leave some of the public without a means to alleviate beaver and muskrat damage.

Alternative 3. Technical Assistance Only. Under this alternative, Nebraska WS would not conduct operational beaver and muskrat damage management in Nebraska. The entire program would consist of only technical assistance and all WS operational beaver and muskrat damage management in Nebraska would be eliminated. Alternative 3 would not allow WS to: 1) respond to all requests, 2) monitor the implementation of producer used non-lethal methods, 3) assist the NGPC or USFWS in meeting wildlife management objectives, 4) address all public health and safety requests, and 5) it would leave some of the public without a means to alleviate beaver and muskrat damage.

Alternative 4. Non-lethal Beaver and Muskrat Damage Management Only. Under this alternative, Nebraska WS would only utilize non-lethal methods for the reduction of beaver or muskrat damage in Nebraska. This alternative would not allow the use of lethal methods by WS to reduce damage caused by beaver or muskrats as described under the proposed action. Alternative 4 was not selected because it would not allow WS to: 1) respond to all requests, 2) assist the NGPC or USFWS in meeting wildlife management objectives, 3) address all public health and safety requests, and 4) it would leave some of the public without a means to alleviate beaver and muskrat damage.

⁴ The No Action Alternative was analyzed and used as a baseline for comparing the effects of the other alternatives as required by 40 CFR 1502.14(d).

Alternatives Considered but not Analyzed in Detail are the Following:

Compensation for Wildlife Damage Losses. The compensation alternative would direct all Nebraska WS' program efforts and resources toward the verification of losses from beaver and muskrats and to provide monetary compensation for those losses. Nebraska WS' activities would not include any direct damage management or technical assistance.

This option is not currently available to Nebraska WS because APHIS-WS is charged by law to protect American agricultural and natural resources, property and public health and safety (Animal Damage Control Act of 1931, as amended and the Rural Development, Agriculture and Related Agencies Appropriation Act of 1988). Analysis of this alternative by USDA (1997) shows that it has many drawbacks: 1) compensation would not be practical for public health and safety problems, 2) it would require larger expenditures of money to investigate and validate all losses and to determine and administer appropriate compensation, 3) timely responses to all requests to assess and confirm losses would be difficult and many losses could not be verified, 4) compensation would give little incentive to limit losses through other management strategies, 5) not all resource managers/owners would rely completely on a compensation program and unregulated lethal control would probably continue and escalate, and 6) neither Congress or the State of Nebraska has appropriated funds for a compensation program.

Eradication or Suppression. An eradication alternative would direct all Nebraska WS' program efforts toward planned, total elimination of beaver and muskrats. Eradication of beaver and muskrats in Nebraska is not supported by Nebraska WS or NGPC. By Nebraska state statute, "...it is the policy of this state to conserve species of wildlife for human enjoyment, for scientific purposes, and to insure their perpetuation as viable components of their ecosystems" (Revised Statutes of Nebraska (RSN §§37-432)). Other statutory policies are to preserve the state's natural resources and wildlife, and to protect wetlands (RSN §§37-401) (Defenders of Wildlife and the Center for Wildlife Law 1996). This alternative was not considered by Nebraska WS in detail because: 1) APHIS-WS is opposed to the eradication of any native wildlife species, 2) the NGPC opposes the eradication of any native Nebraska wildlife species, 3) the eradication of a native species or local population would be extremely difficult, if not impossible to accomplish, 4) an eradication program would be cost prohibitive, and 5) eradication is not acceptable to most people.

A suppression alternative would direct Nebraska WS' efforts toward managed reduction of beaver and muskrat populations or groups on a large-scale basis. To consider large-scale population suppression as a goal of the Nebraska WS program is not realistic, practical or allowable under present APHIS-WS policy. Typically, APHIS-WS activities in Nebraska are and would be conducted on a small portion of the area where beaver or muskrat damage occurs; currently, WS only conducts beaver or muskrat damage management on about 0.5% of the area of Nebraska.

Bounties. Bounties or payment of funds for killing animals suspected of causing economic losses is not supported by the NGPC (B. Morrison, NGPC, 1999 per. comm.) nor WS, and Nebraska WS does not have the authority to establish a bounty program. Bounties were not considered in detail because: 1) bounties are generally not effective in managing wildlife, 2) circumstances surrounding the take of animals are largely unregulated, 3) no process exists to prohibit taking of animals from outside the damage management area for compensation purposes, 4) bounties may increase the take of non-target animals, and 5) Nebraska WS does not have the authority to establish a bounty program.

Finding of No Significant Impact

The analysis in the EA indicates that there will not be a significant impact, individually or cumulatively, on the quality of the human environment as a result of this proposed action. I agree with this conclusion and therefore find that an EIS need not be prepared. This determination is based on the following factors:

5. Beaver and muskrat damage management, as conducted by WS in Nebraska, is not regional or national in

scope.

2. The proposed action would pose minimal risk to public health and safety.
3. There are no unique characteristics such as park lands, prime farm lands, wetlands, wild and scenic areas, or ecologically critical areas that would be significantly affected.
4. The effects on the quality of the human environment are not highly controversial. Although there is some opposition to wildlife damage management, this action is not highly controversial in terms of size, nature, or effect.
5. Based on the analysis documented in the EA and the accompanying administrative file, the effects of the proposed damage management program on the human environment would not be significant. The effects of the proposed activities are not highly uncertain and do not involve unique or unknown risks.
6. The proposed action would not establish a precedent for any future action with significant effects.
7. No significant cumulative effects were identified through this assessment. The number of beaver and muskrat taken by WS, when added to the total known other take of both species, falls well within allowable harvest levels.
8. The proposed activities would not affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places, nor would they likely cause any loss or destruction of significant scientific, cultural, or historical resources.
9. An informal consultation with the USFWS confirmed that the proposed action would not likely adversely affect any T&E species.
10. The proposed action would be in compliance with all federal, state, and local laws imposed for the protection of the environment.

Decision and Rationale

I have carefully reviewed the EA and the input from the public involvement process. I believe that the issues identified in the EA are best addressed by selecting Alternative 1 (Continue the Current Nebraska WS Program - No Action/Proposed Alternative) and applying the associated mitigation and monitoring measures discussed in Chapter 3 of the EA. Alternative 1 would provide the greatest effectiveness and selectivity of methods available, the best cost-effectiveness, and has the potential to even further reduce the current low level of risk to the public, pets, and T&E species. WS will continue to use currently authorized wildlife damage management methods in compliance with all the applicable mitigation measures listed in Chapter 3 of the EA. I have also adopted the Pre-Decisional Nebraska Beaver and Muskrat Damage Management EA along with Appendix A of the Decision document as the final. Most comments identified from public involvement were minor and did not change the analysis.

For additional information regarding this decision, contact James Luchsinger, USDA-APHIS-WS, P.O. Box 81866, Lincoln, Nebraska 68501-1866, telephone (402) 434-2340.

/s/

04/26/01

Michael V. Worthen, Regional Director

Date

APHIS-ADC Western Region

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- U.S. District Court of Utah, 1993. Civil No. 92-C-0052A, January 1993.
- WS Directive 2.105. The WS Integrated Wildlife Damage Management Program
- WS Directive 2.201. ADC Decision Model

APPENDIX A

Response to Comments to the Pre-Decisional Environmental Assessment

NEBRASKA BEAVER AND MUSKRAT DAMAGE MANAGEMENT

NEPA requires that proper consideration be given to all reasonable points of view, particularly as they may relate to the issues being considered. In this light, it is important to consider and address concerns or criticisms that may arise. Appendix A of the Decision document is a summary of comments, criticisms and concerns received from review of the pre-decisional EA with the corresponding WS responses. See Appendix A of the EA for a more complete “*Literature Cited*” and Chapter 5 for the list of preparers, consultants and reviewers.

Issue 1: What Damage Triggers Specific Activities

Program Response: This comment highlights the sometimes differing interests and needs of the public as they relate to wildlife and wildlife damage management and the resulting position that wildlife management agencies find themselves. WS uses the Decision Model (Slate et al. 1992) discussed in Chapter 3, pages 3-5, to determine an appropriate strategy for each damage management action, and it is program policy to aid each requester. If damage management efforts are not initiated soon after a problem is detected, losses may escalate to excessive levels, or in the case of human health and safety, people may be injured or killed before the problem is resolved.

In the Southern Utah Wilderness Alliance, et al. vs. Hugh Thompson, Forest Supervisor for the Dixie National Forest, et al., the United States District Court of Utah denied plaintiffs' motion for preliminary injunctions. In part, the court found that a forest supervisor need only show that damage is probable to establish a need for wildlife damage management (U.S. District Court of Utah 1993).

Issue 2: Increase Public Educational Outreach Efforts

Program Response: Beaver play an important ecological role, creating valuable wetlands and wildlife habitat, as described in Section 1.2.2 of the EA. WS works to educate the public about wildlife benefits as well as about wildlife damage management and options to resolve damage problems. Education is an important part of WS' program because wildlife damage management is about finding “*balance*” or coexistence between the needs of people and needs of wildlife (USDA 1997). As requested, WS conducts technical assistance demonstrations, presentations and consultations for property owners sustaining damage and other interested parties. The Nebraska WS Program conducted 77 and 94 beaver and muskrat technical assistance projects in FY99 and FY00, respectively. Additionally, WS provided informational leaflets; in FY99 and FY00, the Nebraska WS program provided 345 and 764 leaflets, respectively, to the public about beaver and muskrat damage management and other wildlife damage problems. Materials distributed included information about the biology, ecology, legal status and benefits provided by beaver as well as non-lethal and lethal damage management methods that may reduce damage.

Issue 3: Body Gripping and Leg-hold Traps are Inhumane, Especially if the Animal Drowns.

Program Response: The WS program is also concerned about animal welfare and continuously evaluates current and new methods because of our concern for animals. WS is conducting trap research at the National Wildlife Research Center and provided grants of at least \$350,000 annually since 1997 to state wildlife agencies to develop Best Management Practices for trapping wild furbearers. While it is regrettable that animals die to alleviate some damage, we believe that if an animal death must occur, then it should occur with a minimum amount of distress and pain, in as short a period of time as practical. The American Society of Mammalogists also states that, “*Field methods used to sacrifice mammals should be quick, as painless as possible, and compatible with ... the size and*

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behavior of the species of mammals under investigation.” (Baker et al. 1987).

Body-Gripping Traps

The American Veterinary Medical Association (AVMA) states, “*Kill traps are practical and effective for animal collection when used in a manner that minimizes the potential for attraction and collection of non-target species*” (Andrews et al. 1993). It appears the AVMA is not objecting to the use of kill traps. In addition, the American Society of Mammalogists recommends using kill traps for medium-sized animals in field investigations (Baker et al. 1987). Also, body-gripping traps have passed the International Humane Trapping Standards for beaver and muskrat (Fur Institute of Canada 2000).

One basic problem associated with animal traps is a lack of defining “*humaneness*” as it relates to animal cruelty (Proulx and Barrett 1991). The definition of humaneness varies between people and cultures (Section 2.2.2 of the EA).

Proulx (1999) reported on state-of-the-art trap technology on the basis of the most stringent animal welfare performance criteria used to date. These criteria established that animals are rendered irreversibly unconscious in < 3 minutes; this standard was initially set for 10-minutes before being reduced to 3 minutes (Federal Provincial Committee for Humane Trapping (FPCHT) 1981). However, this later standard did not consider human safety. Initially, conibear traps were classified as state-of-the-art trapping devices and later were judged to have failed state-of-the-art trapping device standards (Proulx 1999). Novak (1981) found when the striking bars of 330 conibear traps were bent inward, the time to death for beaver was 7-9 minutes. However, this modification leaves no space between the striking bars. Proulx et al. (1995) modified 330 conibear traps by welding clamping bars to the striking bars. This results in a trap of similar appearance as Novak (1981) with bent jaws. A trap modified with clamping bars strike with 20% more force than a standard 330 conibear trap. Since people using the conibear trap occasionally have traps close on their hands, the full force of the trap would strike the hand, and most likely cause injury. We consider this modification, while more beneficial for animal welfare considerations, a detriment to human safety.

In May 2000, the Canadian government determined standard and modified 330 Conibear traps met the Agreement on International Humane Trapping Standards (Fur Institute of Canada 2000) for beaver. They also determined that leg-hold traps with a submersion system, 110 Conibear traps in water, and 120 Conibear traps on land meet the Agreement on International Humane Trapping Standards (Fur Institute of Canada 2000).

In summary, the Canadian government has determined that standard and modified 330 Conibear traps, 110 and 120 Conibear traps, and leg-hold traps on submersion systems met international humane trapping standards. In addition, the American Society of Mammalogists recommended kill traps for medium-sized animals and the AVMA is not opposed to kill traps for wildlife.

Drowning as a Form of Euthanasia

A commentor opposed drowning of beaver and muskrats and considered it inhumane and not euthanasia. There is considerable debate and disagreement among animal activists, veterinarians, wildlife professionals, fur trappers, and nuisance wildlife control specialists on this issue. The Nebraska WS program rarely uses drowning sets when capturing beaver or muskrats and did not capture any beaver in drowning sets during FY 1998 through FY 2000 and generally use drowning sets as a last resort.

The AVMA states “... *euthanasia is the act of inducing humane death in an animal*” and “... *the technique should minimize any stress and anxiety experienced by the animal prior to unconsciousness*” (Andrews et al. 1993). Carbon dioxide (CO₂) causes death in animals by hypoxemia and some animals (cats, rabbits, and swine) are

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distressed before death (Andrews et al. 1993). Even though these animals are distressed, the AVMA states this death is an acceptable form of euthanasia (Andrews et al. 1993). Thus, the AVMA does not preclude distress or pain in euthanasia. In fact, the AVMA supports inducing hypoxemia related distress when necessary to reduce total distress because reducing total distress is a more humane death (Andrews et al. 1993).

The AVMA identifies drowning as an unacceptable method of euthanasia, but provides no literature citations to support this position (Andrews et al. 1993). Ludders et al. (1999) concluded drowning is not euthanasia based on animals not dying from CO₂ narcosis. They showed death during drowning is from hypoxia and anoxia and thus animals experience hypoxemia. In addition, they concluded that animals that drown are distressed because of the stress related hormones epinephrine and norepinephrine, and therefore, drowning is not euthanasia.

Gilbert and Gofton (1981) reported that after beaver were trapped and entered the water, they struggled for 2-5 minutes followed by a period of reflexive responses. Andrews et al. (1993) stated that with some techniques that induce hypoxia, some animals have reflex motor activity followed by unconsciousness that is not perceived by the animal. Gilbert and Gofton (1981) reported that the level of conscious control at this stage is unknown and that anoxia may have removed much of the sensory perception by 5-7 minutes post submersion.

Ludders et al. (1999) reported CO₂ narcosis does not occur until 95 millimeters of mercury in arterial blood is exceeded. Clausen and Ersland (1970) demonstrated that CO₂ increased in arterial blood while beaver were submersed and CO₂ was retained in the tissues. While Clausen and Ersland (1970) did measure the amounts of CO₂ in the blood of submersed beaver, they did not attempt to measure the analgesic effect to the beaver related to CO₂ buildup (Letter from V. Nettles, D.V.M., Ph.D., Southeastern Cooperative Wildlife Disease Study to W. MacCallum, MA Division of Fisheries and Wildlife, June 15, 1998).

When beaver are trapped using leg-hold traps with intent to “*drown*,” the beaver attempt to flee or exhibit a flight response. Gracely and Sternberg (1999) report that there is stress-induced analgesia resulting in reduced pain sensitivity during fight or flight responses. Environmental stressors that animals experience during flight or fight activates the same stress-induced analgesia (Gracely and Sternberg 1999).

Given the short time period of a drowning event, the possible analgesic effect of CO₂ buildup to the beaver or muskrat, the minimal pain or distress exhibited on drowning animals, the AVMA’s acceptance of hypoxemia as euthanasia, the AVMA’s acceptance of a minimum of pain and distress during euthanasia, the acceptance of catching and drowning muskrats approved by International Humane Trapping Standards (Fur Institute of Canada 2000), we conclude that drowning, though rarely used by Nebraska WS, is acceptable. We recognize some people will be unsuayed, but conclude that drowning is an acceptable form of euthanasia.

Issue 4: *WS does not have the Authority to Reduce Damage to Roads, Bridges, And Other Forms of Property*

Program Response: In 1988, Congress strengthened and broadened the legislative responsibility of WS with the Rural Development, Agriculture, and Related Agencies Appropriations Act to control nuisance mammals and birds, not just animals causing livestock or agricultural related damage. This Act states, in part:

"That hereafter, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with States, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammal and bird species that are reservoirs for zoonotic diseases, and to deposit any money collected under any such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control activities."

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WS conducts beaver and muskrat damage management on roads and bridges primarily to prevent flooding to the roadway and to protect human health and safety. The Rural Development, Agriculture, and Related Agencies Appropriations Act does not contain language restricting WS activities but rather, broadens WS' authority and responsibility to cooperate with other governmental agencies and private organizations to reduce wildlife damage.

Issue 5: *The EA Downplayed the Benefits of Beaver on Nebraska Wetlands*

Program Response: We disagree with this comment; the EA discussed the benefits of beaver in detail (Section 1.2.2 of the EA). As stated in the EA, beaver ponds create valuable wetlands that provide habitat for many species of fish and wildlife. These wetland ecosystems also function as sinks, helping to filter nutrients and reduce sedimentation, thereby maintaining the quality of nearby water systems (Hill 1982, Arner and Hepp 1989). Silt-laden waters, particularly waters carrying eroded soil from cultivated, logged, excessively grazed, farmed, mountainous, or developed areas, slow as they pass through a series of beaver ponds and the heavier particles and colloids are able to settle out before the water flows into larger streams (Hill 1982). Aquatic and early successional plant species may become established in the newly deposited sediment, allowing conditions to become favorable for the stabilization of the flood plain by more permanent woody vegetation (Hill 1982). In addition, Woodward (1983) and Wade and Ramsey (1986) indicated that wetlands added an estimated \$59.5 million to the national economy in 1991. The Minnesota Department of Natural Resources has computed a cost of \$300 to replace, on average, each acre-foot of flood water storage that wetlands can provide (EPA 1995). Producing wetlands/marsh habitat through beaver management in New York was also far less costly than developing either small or large manmade marshes, assuming the quality is equal in each case (Ermer 1984).

Beaver ponds may also improve soil quality and provide improved habitat for some fish and invertebrates. The anaerobic conditions caused by beaver impoundments may result in the accumulation of ammonium, so that soil storage of inorganic nitrogen is nearly tripled by beaver impoundments during a 50 year period (Johnston 1994). Arner et al. (1969) found that the bottom soils of beaver ponds in Mississippi were generally higher in phosphate, potash, and organic matter than the bottom soils of feeder streams. Greater biomass of invertebrates and healthier fish were also found in beaver ponds than in feeder streams (Arner and DuBose 1982).

EPA (1995) claimed that wetlands can provide aesthetic and recreational opportunities for wildlife observation, nature study, hunting, fishing, trapping, wildlife photography, livestock water, and environmental education. Habitat modification by beaver, primarily dam building and tree cutting, benefit some wildlife (Medin and Clary 1991, Medin and Clary 1990, Arner and Hepp 1989, Arner and DuBose 1982, Hill 1982, Jenkins and Busher 1979). Beaver may increase habitat diversity by flooding and opening forest habitats, which results in greater interspersed successional stages and subsequently increases the floral and faunal diversity of a habitat (Arner and Hepp 1989, Hill 1982). The creation of standing water, edge, and plant diversity, all in close proximity, results in excellent wildlife habitat (Hill 1982). The resulting wetland habitat may be beneficial to some fish, reptiles, amphibians, waterfowl, shorebirds, and furbearers such as muskrats, otter, and mink (*Mustela vison*) (Miller and Yarrow 1994, Naimen et al. 1986, Arner and DuBose 1982). When the ponds are abandoned, they progress through successional stages which improve feeding conditions for deer (*Odocoileus virginianus*), swamp rabbits (*Sylvilagus aquaticus*), and woodcock (*Philoela minor*) (Arner and DuBose 1982). In addition, beaver ponds may be beneficial to some T&E species, because the USFWS estimates that up to 43% of the T&E species rely directly or indirectly on wetlands for their survival (EPA 1995).

Waterfowl use beaver pond wetland habitats extensively (Arner and Hepp 1989, Novak 1987, Hill 1982, Arner 1964, Speake 1955). In particular, wood ducks (*Aix sponsa*), mallards (*Anas platyrhynchos*), black ducks (*Anas rubripes*), and other dabblers benefit from the increased interspersed cover and food found in flooded beaver ponds (Arner and Hepp 1989, Novak 1987). Also, the attractiveness of a beaver pond to waterfowl varies with age and vegetation (Arner and DuBose 1982). In Mississippi, beaver ponds over three years in age were found to have developed plant communities which increased their value as nesting and brood-rearing habitat for wood ducks

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(Arner and DuBose 1982). Reese and Hair (1976) found that beaver pond habitats were highly attractive to a large number of birds year-round and Novak (1987) found that the value of the beaver pond habitat to waterfowl was minor when compared to other species of birds.

Beaver are generally considered beneficial where their activities do not compete with human use of land or property (Wade and Ramsey 1986). The opinions and attitudes of individuals, communities, organizations, etc. regarding beaver vary greatly and are primarily influenced and formed by the benefits and damage directly experienced by each person or entity (Hill 1982). Property ownership, options for public and private land use, and the effects on adjacent properties or land use also impact public attitudes toward beaver (Hill 1982). In many cases, beaver damage exceeds benefits, resulting in a demand for beaver damage management. Woodward et al. (1976) found that 24% of landowners who reported beaver activity on their property indicated benefits to having beaver ponds on their land and also desired assistance with beaver pond management (Woodward et al. 1985, Lewis 1979, Hill 1976).

Issue 6: The EA did not Consider the Aesthetics of Beaver and Muskrats

Wildlife generally is regarded as providing economic, recreational, and aesthetic benefits (Decker and Goff 1987). Aesthetic benefits are the high value some people place on the beauty of nature; they appreciate the opportunity to observe animals such as beaver or muskrats in their natural environments and are opposed to any action that would remove beaver and/or muskrats from an environment where they can be appreciated. There is some concern that the proposed action or the alternatives identified in the EA would result in the loss of aesthetic benefits to the public, resource owners, or neighboring residents.

The proposed action provides relief from damage or threats to public health and safety. Nebraska WS only conducts beaver and muskrat damage management at the request of the affected home/property owner or resource manager. When beaver or muskrats cause problems and threats to human health and safety, they are sometimes removed. This may reduce or alleviate damage and in turn, could affect aesthetics. However, beaver and muskrat populations are healthy throughout the State of Nebraska and the United States and we believe that there are nearly limitless opportunities for viewing them in natural settings and native habitats. Thus, we acknowledge the aesthetics of wildlife and the value the public places on this aspect of wildlife while striving to address damage in a responsible and appropriate manner.

Issue 7: Cost of Management

NEPA does not require preparation of a specific cost-benefit analysis, and consideration of this issue is not essential to make a reasoned choice among the alternatives being considered. A cost-benefit analysis of WS' activities would show a higher cost per unit benefit as methods are restricted. For example, chemicals are cheap and very effective for certain wildlife damage management issues, yet they are not used for beaver damage management. Thus, our social value system has essentially established limits on the cost effectiveness of beaver damage management. As restrictions on the use of wildlife damage management tools and methods increase, cost-effectiveness of damage management is reduced.

The effectiveness of each alternative is based on the methods employed under that alternative. Effectiveness of the various methods may vary depending on circumstances at the time of application. Method effectiveness and/or applicability depends on factors such as weather conditions, time of year, biological and economic considerations, legal and administrative restrictions, or other factors. Thus, to implement the most cost-effective management, it is important to maintain the widest possible selection of damage management methods for use in selectively and effectively resolving beaver and muskrat damage management problems.

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